TEACHING STRESS AND INTONATION TO IMPROVE INTELLIGIBILITY OF UNDERGRADUATE STUDENTS OF AMU: A CALL BASED APPROACH

THESIS

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BY

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UNDER THE SUPERVISION OF

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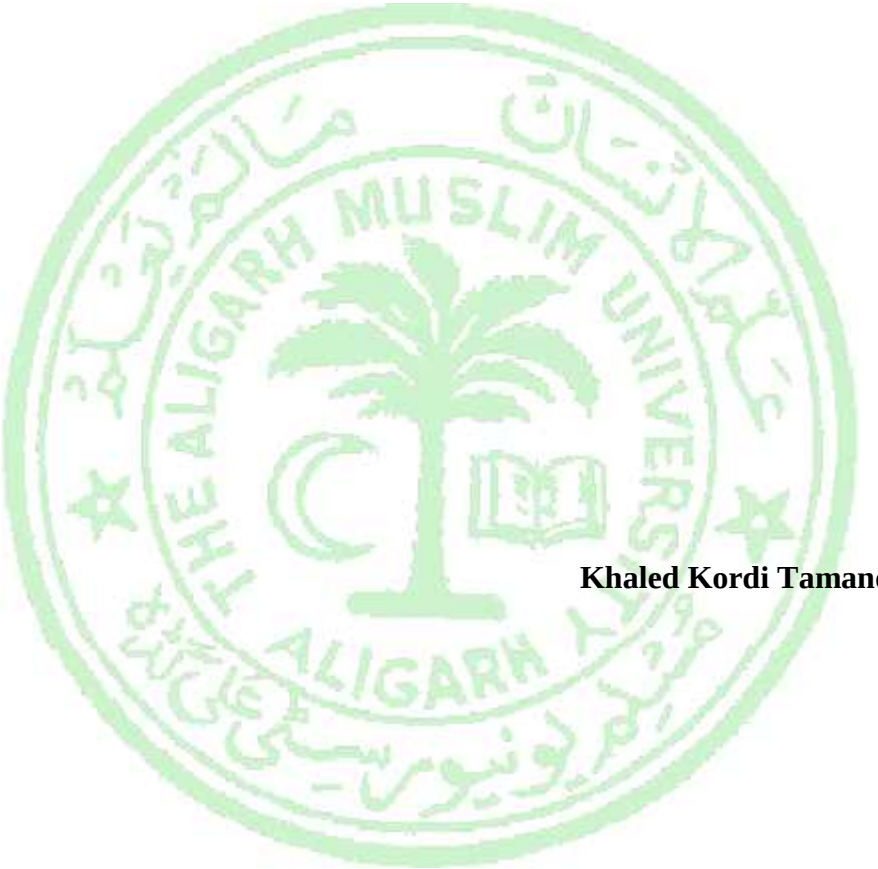

Khaled Kordi Tamandani

TO:

MY FATHER

AND

MY WIFE

WHO

ALWAYS PICKED ME UP ON TIME AND ENCOURAGED ME TO GO ON EVERY ADVENTURE, ESPECIALLY THIS ONE

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Khaled Kordi Tamandani

CONTENTS

LIST OF ABBREVIATIONS

Acronyms	Full Forms
AMU	Aligarh Muslim University
B.A	Bachelor of Arts
IPA	International Phonetic Association
OVEs	Older Varieties of English
RP	Received Pronunciation
NVE	Nativized Variety of English
NNS	Non-Native Speaker
LFC	Lingua Franca Core
GenAm/GA	General American
ESL	English as a Second Language
L1	Mother Tongue
L2	Second Language
EFL	English as a Foreign Language
FL	Foreign Language
TEFL	Teaching English as a Foreign Language
TOEFL	Test of English as a Foreign Language
TESOL	Teaching English to Speakers of Other Languages
LS	Learning Strategy/ Learning Strategies
LLS	Language Learning Strategy
NSR	Normal Stress Rule
ASR	Automatic Speech Recognition
CAP	Computer Aided Pronunciation
NS	Native Speaker
ITAs	International Teaching Assistants
SLA	Second Language Acquisition
TTS	Text-to-Speech
SAE	Standard American English

LIST OF TABLES

LIST OF FIGURES

Chapter - 1

Introduction

CHAPTER 1

INTRODUCTION

1.1.The Importance of English as a Global Language:

English can be considered as one of the most widely spoken languages in the world and regarding its actual number of speakers, it is the official spoken language in the world. It is the primary language used in any international affairs. English language is officially accepted and being applied even in those nations or countries where don't use it as their primary spoken language. It is indisputably the main language of global trade and commerce. (Crystal, 2010)

While there has been much progress in language-translation software and allied technologies, the primary language of the internet is English. English is usually the language of the most mobile and personal computer software, peer-to-peer, social media networks, and websites. Software and hardware installation guides and product fact sheets of popular electronics and entertainment devices are usually written in English than written in other languages. The universities and colleges in Great Britain, Unites States, Canada, India, Australia, New Zealand, and Singapore, which attract numerous international students, the primary medium of education and language of instruction is English. English language is the most useful and efficient language in most of the top business schools, medical centers, and advanced-study institutes, in which they use it in every activity at their institutes. Most technical periodicals and peer-to-peer journals that give international acclaim to engineers, scientists, technologists, and technocrats are available and printed in English.

1.2. The Importance and Role of Phonetics and Phonology in English Language Teaching (ELT)

1.2.1. Phonetics

The teaching of pronunciation has gone through many changes throughout the history of English language teaching and learning. It was one of the most neglected aspects in English, and it has got more attention in the past half of the twentieth century with the invention of audio-lingual devices and rise of using Direct Method. Throughout history, teachers and linguists have attempted to overcome the difficulty of teaching pronunciation. In this respect, they have tried to develop various methods

and techniques with other related sub-disciplines such as phonology, phonetics, and second language acquisition among others.

Pronunciation is defined as "the manner in which speech sounds, especially connected sequences are articulated by individual speakers or by speakers generally" (Trask, 1996, p. 21). Pronunciation is closely linked to the study of phonetics which involves the scientific study and description of speech sounds. According to Pennington & Richards (1986), pronunciation can be defined as "articulation of individual sounds and, to a lesser extent, with the stress and intonation patterns of the target language" (p. 32).

Hence, the second definition does not limit pronunciation only to the way in which sounds are articulated but goes further to unify other articulatory aspects namely stress and intonation patterns.

Phonetics is essential for anyone who is a teacher or learner of a foreign language. Phonetics is one of the most relevant factors in teaching or learning English as a foreign language or second language. Teachers can examine the several differences between the source language and the target language and explain these differences to learners. Phonetics also helps the learners in a better understanding of the language, and it shall help them to sound more intelligible while speaking.

Sweet (1964), one of the most famous phoneticians who made several important discoveries in the field of English phonetics said that without phonetics, we could neither observe nor record the simplest phenomena of language.

Considering English as the mother tongue for half a billion people and the second language for almost a billion, knowing about phonetics carries additional weight. With several speakers around the globe, it is hard to differentiate among all existing varieties of English. That is the reason that phonetics is essential for ESL learners who should be cautious about the variety of English they use.

1.2.2. Phonology

While learning English, it is crucial for teachers to teach students the correct pronunciation of English words as mispronunciation may mislead the listener. Therefore, the teachers of English must have good knowledge of phonology of English language.

Phonology is the study of sounds in a particular language. It is an important area of language for ESL or EFL speaker. For example, the word "balm" which is supposed to be pronounced as "/bɑːm/", may be pronounced as /bɒm/ or the word "car" which is expected to be pronounced */kaː/* may be pronounced as */kaːr/*. Therefore in the pronunciation of English words, teachers should be familiar enough with manner of articulation in English such as; fricative, affricative, stop, nasal and liquid. In addition to that, an EFL or ESL teacher should also know about the place of articulation such as glide, labial, labiodental, interdental, velar, glottal, and alveolar.

There has been an effort since 1885 to create a unique universal system for transcribing different speech sounds to help linguists and teachers to transcribe the language accurately and consistently as a result International Phonetic Alphabet (IPA) was introduced (O'Grady & Archibald, 2005).

Considering the features mentioned above about phonology, teachers can minimize the pronunciation error in English. Moreover, English phonology not only focuses on proper pronunciation, but it also gives importance to stress, pitch, and intonation as these are crucial while producing different types of utterances. For instance, to form a question in a conversation, it is not necessary to say a grammatically correct form of a question; instead, we can form the question by changing the intonation of our voice. For instance, *"So, you are going?"*

Teaching stress and intonation to students are important because good comprehension of stress and intonation in English would enable them to sound more natural, fluent, and intelligible in English language skills, particularly in speaking skill.

Altogether phonology plays an extensive and prominent role in helping ESL teachers in dealing with sound elements. These aspects of sounds include phonetics, place of articulation, and manner of articulation, pitch, stress, and intonation. Learning phonology also helps the teachers to avoid errors in pronouncing and articulating English words.

1.3. The Status and Importance of Stress and Intonation in ELT

Speaking and understanding English does not come only from using correct grammar and vocabulary. Native English speakers convey meaning in their sentences with correct stress and intonation, i.e., the ups and downs and musical notes of their

sentences. Stress and Intonation are vital parts and also a complex aspect of communication, and mostly they are counted as the unconscious mechanisms among the speakers. Stress and Intonation are the music of language or melody of speech. They belong to suprasegmental aspects in English pronunciation. Intonation is about the ability to accurately determine whether another speaker has finished speaking, or is raising a question or preparing to continue speaking. It can be done through identifying the tone within the sentence. On the other hand, stress is the loudness or emphasis on a certain syllable in a polyisyllabic word in which the pitch of the voice rises and falls throughout an utterance which creates melody or intonation contour.

Stress and intonation are concerned about how to say things rather than what to say. We would be unable to understand the thought and expression of a speaker's words or sentences without proper stress and intonation. Native speakers can speak with proper stress and intonation naturally, but as a second language or foreign language learner, it is very difficult to achieve proper stress and intonation. Stress and intonation are used to show the speakers' attitude and emotions referring to the difference between statement and questions and also between different types of questions. It focuses attention on the essential elements of spoken messages, and it also helps in improving communicational interaction. To be a fluent English speaker, learners need proper, interactive, and practical explanation and guidance of stress and intonation.

Altogether, in English language teaching, stress and intonation are communicatively necessary, but they are notoriously difficult to be learned by Second language learners.

1.3.1. The Importance and Status of Stress in ELT

In Linguistics, word stress is defined as the emphasis that is given to certain syllables in a word, or to particular words in a sentence. Stress is commonly referred to properties such as full articulation of the vowel, increased loudness, length of vowel sounds and changes in pitch. The stress that is placed on syllables within words is called word stress or lexical stress. Some languages have fixed stress in which the stress on any polysyllabic word would fall on a specific syllable, such as the first or the penultimate syllable of that word. However, in some other languages like English, the position of stress is variable and is not predictable, and even

sometimes there is more than one level of stress in a word, such as primary stress and secondary stress.

The location of lexical stress in the word may change depending on certain general rules that apply to the language or dialect in question. Pitch, intensity, and duration, all contribute to the differentiation of stressed and unstressed syllables, but not equally, and the differentiating power of each acoustic correlate varies across languages.

On the other hand, stress is the use of extra respiratory energy in the pronunciation of a syllable in a polysyllabic word. It is the level of force used for the pronunciation of a sound, a syllable, or a word. In English, some syllables are pronounced with a stronger level of breath force than the others. Syllables that are pronounced in such a way are called stressed syllable. Syllables that are not given much force are called unstressed or weak stressed.

For instance, the word "conduct", which consists of two syllables, can either be pronounced in two ways; stress on the first syllable as /ˈ*kɒndʌkt*/ (N) or with stress on the second syllable as / *kənˈdʌkt* / (V). It indicates that correct stress on the right syllable changes the meaning and form.

According to Gimson, stress is the stronger breath energy and muscular effort exerted in the articulation of a syllable giving it more prominence than the other syllables in an utterance constituting a text. (Cruttenden & Gimson, 2014)

1.3.2. Status of Intonation in ELT

Intonation is all about the pitch in our voice. The pitch is just like a line which can be described regarding its slope or its endpoint. It is a sequence of pitch movement- rises and falls- or insertion between a series of two or more level target tone. Intonation can also be called as the melody of speech. The study of intonation is about how the pitch of the voice rises and falls and how a speaker would use the pitch variation to convey linguistic and pragmatic meaning. Intonation also includes the study of the rhythm of speech and how the stressed, and unstressed syllable functions as a structure on which the patterns of intonation are based.

Generally speaking, intonation is the variation in the perceived pitch of the speaking voice. The pitch of the voice varies throughout the speaker's sentence. It is

tough and complex to describe the variation accurately, and it would not reveal anything about the patterned phenomenon that is needed for teaching intonation. That is because all the variations do not have the same type of communicative importance.

Intonation is used for reflecting the information structure in an utterance, and it points out the essential constituents. Intonation can indicate the discourse function as well; for instance, most people can understand that saying a sentence with one intonation shows the statement while saying the same sentence with another intonation may indicate it as a question. Intonation is used in communication to express friendliness, hostility, or enthusiasm. For example, "you know what I mean"(Voice goes down at the end) .This can be a statement if we are talking to somebody and we are explaining something, but we know that they understand, maybe because they've had the same experience. But if we are talking and we want to make sure that the person is understanding us, we might say it by asking a question; "You know what I mean?" (Voice goes up at the end). Intonation also can be used in turn-taking in a speech as there are intonational mechanisms, a speaker may use intonation to show that they are done speaking, or they are in speaking flow and don't want to be interrupted.

Intonation is all about pitch of the voice while speaking. Pitch is used in many languages in the world. It is used for distinguishing the words. Many languages in the world use intonation such as Thai, Hausa (Nigeria), and Mixtec (Mexico) in which words are distinguished by consonants and vowels and also by using a restricted set of unique pitch forms or heights on each syllable. These types of languages are called tone languages. Some other languages like Swedish and Japanese, use a more limited pitch pattern for distinguishing the words; these languages can best be called lexical accent languages. All languages that have tone and lexical accent, also have intonation but generally speaking, the more we use the pitch in a language for distinguishing the words, it has to develop less scope in an elaborate intonation system. On the other hand, English is not a not a lexical or tone language, and in general, it has a complex intonation pattern rather (Aarts & McMahon, 2006, p. 434).

According to Roach (2000) Intonation in English has four main functions;

1) the attitudinal function (affect), where intonation is applied to show emotional situation or behavior.

Eg: *I can't **believe** he gave you a ride home!*

(2) the accentual function (focus), wherein intonation is used to make specific words or syllables stand out in a stream of speech.

Eg: *hope you got the **red** scarf.*

(3) the grammatical function, in which intonation is used to discriminate grammatical units or, for example, in below mentioned sentences, they suggests the rule that *yes/no* questions, generally,end with a rising tone whereas *wh* questions end with a falling tone:

- *Shall we go↑ tomorrow?*
- *Where shall we go ↓ tomorrow?*

(4) the discourse function (interaction), in which intonation is used to regulate conversational behavior, or to focus a listener's attention on specific elements of a spoken message.

Eg: *Which king did you play?*

*The king of **HEART***

To overcome the lack of learnability in intonation among teachers and students, the modern materials of pronunciation have increased their focus on discourse features of intonation especially on features like tonality or chunking and tonicity or focus which are considered as the most teachable and learnable elements. There is also a common agreement that the effective function of intonation – i.e., expressing emotions and attitudes – is the most difficult area to teach; Seidlhofer (2001) suggested that the attitudinal function is "practically impossible to isolate for direct teaching" (p. 64). Roach (2000) also suggested that the only way to acquire the useful function of intonation in a language is to live amongst its speakers.

Despite above sayings claiming that intonation was difficult to be perceived and taught, there is general agreement that says tonicity and tonality are teachable, learnable and necessary for intelligibility. It claims that focusing on these types of elements may enable the learner to acquire more intelligibility and it makes him/her capable of performing the main communicative functions of English. Even though if these features are taught, but formal mechanisms for testing the efficient use of them are not freely available. Intonation is not directly examined in well-known English

proficiency tests such as IELTS and TOEFL which one may wonder if this is because of lack of confidence among the teachers and examiners of spoken language.

Intonation can carry a variety of different kind of information. It indicates the structure of grammar, though not in a coordinated way while the end of an intonation pattern co-occur with the end of a grammatical structure such as a clause or a sentence and even major grammatical boundaries may lack intonational marking especially when the speech is rapid.

If we do not use intonation in our speech, it would sound monotous. It would remain on one pitch throughout the sentence, or it will employ the same tune all the time. However native speakers do not do any of those things; on the contrary, they make proper use of pitch in their speech, i.e., they make the pitch of their voice fall, rise, swoop and jump in all types of various ways. Even a boring speaker has access to a very considerable range of intonation pattern, and even some speakers are more expert than others in using and exploiting intonation patterns in their speech. Lively speakers such as lecturers, preachers, broadcasters, politicians or people in business are the best example of speakers who make safe and efficient use of wide range of intonation patterns that exist in the English language. These kinds of speakers can address an ordinary audience that its participants are in a regular everyday informal conversation. (Wells, n.d.)

This study attempts to explore how intonation works in English language and describe some selected intonation patterns from the viewpoint of English Language Teaching (ELT). The emphasis is given on those points that are considered effective for those learning or teaching English as a non-native language.

Intonation is important and useful for students of English because the linguistic analysis of any language is indeed academically valuable and for English learners and also there is a practical reason to make an attempt to acquire a command, both passive and active of its intonation. While studying pronunciation, English learners usually concentrate on segmental phonetic i.e. the sound of the language. It is relatively very important to learn, recognize, and reproduce the sound of vowels and consonants in English and to identify their differences with each other. Every learner should be able to determine the difference between *th* sound of “thin” and “this”, the vowel sound in “nurse” and the differences in sound between “leave” and

“live”, “bet” and “bat”. Most English learners can recognize that “pattern” is stressed on the first syllable, but “below” on the second syllable.

Intonation is usually neglected which in result some teachers may fail to teach it, and learners also fail to learn it. Although some gifted learners may be able to pick it up more or less unconsciously, many of them will not. The reason behind the following issue may be explained as follow; native speakers are aware that learners face difficulty with vowels and consonants. While interacting with non-native speakers of English, they make allowances for segmental errors, but they do not make allowances for intonation errors. That is because they may not know that the intonation can be mistaken.

Although there are various possible intonation patterns in English, every one of them has a different meaning, and the problem is that the pattern that the speaker is using in his sentence may not deliver the sense that he intends. Speakers of English assume that according to the intonation pattern that we use, we mean what we say while it may not be what we are thinking or saying exactly.

1.3.3. The Prosodic Feature of Stress and Intonation

The prosodic or suprasegmental features of speech include pitch, loudness, and speed. These together make up the rhythm of speech and they combine with pauses to break up the flow of speech. To some extent, prosodic features are the same in all languages. It is true that in all human societies the native speakers may speed up when they are surprised, excited, or impatient and may also slow down when they are thoughtful or upset. We generally speak quietly when we do not want to be heard, on the contrary, we talk loudly when we want to be heard, but it is evident that different languages are also different in their prosodic characteristics. Simply applying the intonation patterns of one’s mother tongue (L1) to a foreign language (L2) causes him/her to be misunderstood and sound foreign by other native English speakers.

Stress is a major communicational aspect of English language, and it is recognized by a combination of factors like duration, loudness, and pitch. In English stress, placement is used lexically to differentiate between the words in the dictionary. As we have discussed before the complicated factor of stress in the English language is that it is widely known by pitch movement.

Intonation is another prosodic feature of English which is mainly recognized through different pitches in the voice (high-level, mid-level, low-level, rising tone, or falling tone). A low-level pitch is the result of slow vibration of vocal folds in human's pharynx whereas the high pitch is produced from rapid vibration.

1.4. Computer Assisted Language Learning (CALL) Methods and Its Effectiveness in ELT

There has been a massive development of user-friendly computers and software and also a rapid reduction in their prices in the last decade. Nowadays computers are present in almost every home, office, and school. In the current century, a computer is a vital need for everyone to use it to some extent to function in the society. In several countries of the world, in the educational context, audio language labs are being replaced by computer centers or computer labs equipped with internet connection facility.

Computer Assisted Language Learning (CALL) is an approach to teaching and learning in which the computer or computer-based resources such as software or the Internet are used to present, reinforce and evaluate the materials which have to be learned. It includes a substantial interactive element. Using CALL also involves the search for and the investigation of applications in language teaching and learning. CALL is also known by several other terms such as technology-enhanced language learning, computer-assisted language instruction, and computer-aided language learning. (Levy, 1997)

Considering the use of computers in language teaching and learning, it has been several years that teachers and researchers have been testing, using and developing ways to use computers in their teaching methods since computer devices have been available for most of the students. However, many language teachers are still uncertain about the methods in which they can effectively use computers for language learning. With the fast development of computers in our daily life, we also started using computers in our classroom. Language teachers can assist the development of learners' language acquisition by using computer-assisted language learning (CALL) in current teaching context (Pennington, 1999).

We are currently at the "integrative stage of CALL, which is a result of the expansion of technological development such as multimedia and Internet. These two

innovations allow the learners to gain access to a more authentic learning materials. Multimedia devices enable one to improve his/her four skills, and the Internet provides interaction opportunities in an English language environment. Although the scope of CALL has been extended in recent years, it is still not a perfect and complete method for teaching or learning all aspects in a language. The quality of programs has not yet acquired the level of evaluating the users' natural spoken language or its usage appropriateness in the context above.

1.4.1. Praat Software as a CALL Tool

Praat (the Dutch word for "talk" or "speak") is a free scientific computer software for the analysis of speech in phonetics. It was programmed and continues to be developed, by Paul Boersma and David Weenink. This software also supports speech synthesis, including articulatory synthesis. Praat is one of the most commonly used programs for the purpose of speech analysis among linguists. (Boersma & Weenink, 2015)

1.5. Objectives

The objectives of this thesis are:

1. To understand and discuss the origin definition, and aspects of the CALL-based approach.
2. To find out, whether teaching through CALL-based approach can improve the students' knowledge about stress and intonation.
3. To find out, whether teaching stress and intonation through CALL-based approach is effective in improving students' pronunciation intelligibility.

1.6. Research Questions

In this study, we will try to find out the answers to the following questions:

1. What is CALL-based approach? What are its characteristic features? How is it different from the traditional methods of teaching stress and intonation?
2. To find out how CALL-based approach can be effective in teaching stress and intonation at the Undergraduate ESL classroom at AMU?
3. Can learning about stress and intonation improve speaker's intelligibility in communicative skills?

4. Is using CALL based approaches for teaching stress and intonation effective on second language learning?
5. How can students improve their intelligibility in using stress and intonation more efficiently?

1.7. Research Methodology

The nature of present study will be both qualitative and quantitative. While it would discuss the various aspects of CALL-based approach, it would also conduct data analysis to identify the need, use, and prospects of this method.

First, We will evaluate the knowledge of undergraduate level students in stress, intonation and the intelligibility of their pronunciation in using correct stress and intonation before the application of CALL method. We will perform the task mentioned above through conducting two pre-tests and their related intelligibility tests. The first pretest consists of 30 questions on word stress, and the second pretest contains 30 questions about sentence intonation. After conducting each test, the intelligibility tests for the same pre-tests on stress and intonation will be carried out by recording the voice of students when they pronounce or read the words and sentences in their own way. After completing the pre-tests and their related intelligibility tests by the students, the proposed CALL method of teaching will be applied to the students with the necessary CALL devices and software.

After carrying out the pre-tests, the researcher will implement the proposed CALL-based approach to the learners. Then the researcher tries to evaluate the students' improvement in identifying the stressed syllable, the tone of the sentence and their intelligibility of pronunciation in stress and intonation after the application of the CALL-based method. For doing that, there will be conducted two post-tests on stress and intonation along with the intelligibility tests for the same post-tests in the same way that was carried out for the two pre-tests.

When all tasks above (pre-tests, intelligibility tests of pre-tests, application of the CALL-based method of teaching, post-tests, and intelligibility tests for post-tests), are completed, then we will evaluate learners' intelligibility of pronunciation in using correct stress and intonation. We will do the assessment by analyzing their recorded voices with the help of Praat sound analyzer software before and after the application of the CALL-based approach. When we have students' recorded sound clips analyzed,

then we can monitor and assess their intelligibility progress by observing and comparing their sound clips in pre-tests and post-tests.

1.7.1 Participants

The participants of this study are 15 male students chosen from the B.A (English) final year of the undergraduate level of AMU. Students will principally be from the age group of 17-21 years, who have already had English language instruction from 5-15 years.

1.7.2 Instruments and Tools

In this study four sets of tests in the forms of Pre-test1, Post-test1, Pre-test2, and Post-test2 followed by an intelligibility test for each one of them was conducted for the purpose of evaluating students' skills in the topic of stress and intonation before and after the application of the CALL-based approach. Each test consists of 30 questions and the intelligibility tests for each of the tests mentioned above will be conducted digitally through recording students' voice by a computer device. Then each student's voice for the pronunciation of each word and utterance of each sentence will be analyzed through Praat voice analyzer software.

1.7.3 Data Interpretation and Analysis

For the purpose of data analysis, the statistical software package Microsoft Excel for Windows (Version 2013) and voice analyzer software Praat for Windows (version 5.4.22) will be applied to process and analyze the collected data. Microsoft Excel will be used for the quantitative aspects of the study in which the improvement of the students throughout different tests will be statistically monitored and measured. With the help of Praat voice analyzer, the students will be guided to evaluate and improve their intelligibility in uttering the sentence with correct intonation or pronouncing the words with correct stress. Hence the Praat software will be used for qualitative aspects of this study.

As it is already mentioned, there are two pre-tests and two post-tests in this study in which each test contains 30 questions. Hence there will be a total number of 120 questions for each student. Each question contains a word in which the learner will have to choose the right stressed syllable for stress related tests, and in intonation related tests each question includes a sentence in which the student should choose the right intonation.

After completing each test, every student will go for intelligibility test of the same pre-test or post-test. For participating in intelligibility test, the students' voice will be recorded for all questions which are present in Pre-test1 (Appendix 1), Post-test1 (Appendix 2), Pre-test2 (Appendix 3), and Post-test2 (Appendix 4); that means there will be 120 recorded voice clips for each student for the purpose of intelligibility analysis of students. Since there are 15 students as the participants of this study, so there will be a total of 1800 recorded voice clips of the students to be analyzed with Praat software for the purpose of intelligibility analysis and evaluation. Likewise, the total number of answered question by the students will be 1800 questions i.e. 120 questions per student.

The statistical procedures used for this research were descriptive statistics, frequency, and the percentage which will be calculated and analyzed by Microsoft Excel software.

1.8 Plan of the Study

This thesis consists of six chapters. Chapter One is an introduction to this topic, and it is about the formulation of problem, and statement of intent and design of the study. Chapter Two is literature review which is about the stress and intonation, teaching and learning approaches used for stress and intonation and the focus is on teaching methods in the past long years. Chapter Three is about the history of CALL-based approach in ELT. Chapter Four is about the current CALL-based approach of teaching stress and intonation that is used in this study. Chapter Five is about analyses of the collected data and findings for the further conclusion of the research. Finally, Chapter Six will provide a summary of the results, conclusion, recommendations, suggestions, and limitations of the present study.

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Chapter - 2

A Review of Literature on Teaching Pronunciation

CHAPTER 2

A REVIEW OF LITERATURE ON TEACHING PRONUNCIATION

This chapter reviews the studies regarding the importance of stress and intonation as one of the important features of English phonetics and pronunciation in improving communicational skills such as speaking and listening, and it discusses different language learning strategies that help the learners of English language to enhance their intelligibility by using proper stress and intonation.

2.1. Introduction

In the field of teaching English as a second language (ESL) or teaching English as a Foreign Language (EFL), the efficiency and applicability of concerned teaching and learning methods will turn to be a very controversial matter. Second language educators have different opinions about the importance of including pronunciation practice activities in their teaching or lesson plans. Classroom activities should be based on the needs of the students. For instance, some students may prefer to improve their vocabulary skill or strengthen their communicational skill in English. Regardless of current orientation or what skill the student may need to improve, perhaps we can say that teaching pronunciation is considered as an essential task in an ESL class where survival skills are very vital to the students' everyday lives. Besides increasing their English comprehension in the classroom, they also need to carry on their communication and interaction even outside the class and different situation. Students need to understand and to be understood. If their listening skill is not good enough, they will be cut off from the language except in printed form, and if they do not sound intelligible, they will not be able to communicate with native speakers (Gilbert, 1984).

In the context of English as a foreign language (EFL) setting, survival skills are considered to have a less important role. English is not the necessary language for EFL students to communicate with each other and even it may not be used among the friends, and there is no need to be understood outside of the classroom. Hence it would be easy, for the teachers to ignore putting pronunciation tasks in their lessons because they think there is seldom or no need for the students to work on that aspect

of the language. This attitude leads the students to the poor acquisition of explicit command of the English language (Gilbert, 1984).

There are different interlinked processes in learning English which means that each skill or area of the language that is being practiced can be helpful for improving other aspects of the language. Pronunciation and listening comprehension are interconnected by a unified system in which individual sounds are systematically related together. (Gilbert, 1984). When the English pronunciation skills are improved, obviously their speaking and listening skills will become significantly refined. Spelling skills can also be improved when one's knowledge of English pronunciation is increased

2.2. History of Pronunciation in ELT

Pronunciation is always believed to be a difficult area for both teachers and learners of English. Like listening, pronunciation is also partially ignored in language teaching as they pay more attention to reading and writing, for the purpose of succeeding in the examination in societies which are very much focused on these skills. However, it seems somehow insignificant to study a foreign language if one does not converse in that language with other speakers of it and, and in order to achieve that, one must learn how to pronounce it in an intelligible way for a variety of listeners. English, whether by accident of history, foreign policy, or through purposeful educational policy, has arisen as an international language, and being intelligible worldwide. Therefore it has received much attention.

Pronunciation takes a lengthy and eminent history in second language teaching. Seidlhofer (as cited in Carter & Nunan, 2001) said it "stood at the very beginning of language teaching methodology as a principled, theoretically-founded discipline, originating with the late-nineteenth- century Reform Movement" (p. 56). Phoneticians who were interested in teaching pronunciation were brought together by some European countries by the Reform Movement. It led to the establishment of pronunciation as one of the main concerns of second language teaching lasting well into the second half of the twentieth century, even in the teaching of English (Collins & Mees 1999). Their collaboration also led to the formatting the International Phonetic Association and also the development of the International Phonetic Alphabet (IPA), which is capable of providing the full inventory of sounds of all known

languages. The IPA is still the universally recognized system of phonetic transcription. When English pronunciation is taught in institutions globally, in the most of the cases the adopted models are taken from what are sometimes referred to as Older Varieties of English (OVEs). These models are being used for the most of British and American English. The accents are generally chosen as prototypes. Received Pronunciation (RP) for the case of British English and General American (GA) for the case of American English, are widely described in pronouncing dictionaries (Roach et al., 2006; Upton et al., 2001) and books on English phonetics and phonology (Roach 2000; Kreidler 2004). Although some more recently conceived texts do include other English models (Collins & Mees 2003; Deterding & Poedjosoedarmo 1998; McMahon 2002). Countries like Japan, Taiwan, the Philippines, and many South American countries have a tendency to use American English as their preferred model. On the contrary British English is found in former colonies and protectorates, such as India, Hong Kong, and certain African countries, in South American countries such as Chile and Argentina, and also in Europe.

This approach of selecting a model is natural rather than experimental and can be based on sociocultural, political or market-driven choices. OVEs are considered by many as “proper English”, and any local L2-influenced variety is simply not good enough to be considered as an English model. An example of this kind of English can be seen in the case of India; although Indian English is a recognized nativized variety of English (NVE), many Indian speakers of English aspire towards RP, rather than following Indian English as a recognized model in its right. English language teachers, too, may find that they come up against prejudice in comparison to native speakers of OVEs, or even they may feel inferior as teachers if they have a local or non-native speaker variety of English. Writers such as Walker (2001) and Moszynska (2007) bring to mind that, however, it does not mean that a native speaker of an OVE is automatically “fully prepared to teach students at various language levels” (Moszynska, 2007, p.3). As Walker (2001) comments, “it must not be assumed that the native speaker is necessarily best-equipped person for teaching pronunciation; the best instructor is the person with a detailed practical knowledge of both the L1 and L2 phonetics” (p. 8). Indeed, native speaker varieties may not be intelligible to other native speakers.

In research, non-native speaker English is usually compared with OVEs, such as in Setter et al., (2006), Pickering (2002), Low et al. (2000) and Tajima et al. (1997). Similarly, native speakers of OVEs are very often the listeners in intelligibility tests (Anderson-Hsieh et al. 1992; Tajima et al. 1997). Although different studies which look at the opposite do exist, for example, Derwing & Munro (2001) and Derwing et al. (2002), which look at how intelligible native speakers are to non-native speakers. Although it is, essential to have an appropriate reference for such judgment and studies, in future, it might be the case that comparisons that are made between accents and varieties of English which never come under the category of OVEs. If intelligibility between native speakers and non-native speakers are source of data for researchers, intelligibility in English among NNS groups of English would seem to cause many possibilities for research. It may develop several teaching materials which are geared towards particular English communication situations for instance between Hong Kong and Japanese speakers of English, perhaps. The scope of study then is almost infinite.

2.3. Recent Theory: The Lingua Franca Core

Jennifer Jenkins' Lingua Franca Core is a theory that recently has had a great impact on teachers who are specialized in English pronunciation. Using conversations in English among non-native speakers as a source of data, Jenkins (2000) figured out that the main issue for intelligibility in international contexts was pronunciation. With a more accurate analysis, she found important areas which need to be discussed if the information had to be exchanged efficiently. To summarize, these areas are as follows:

1. The complete consonantal list of English, with the following conditions:

a. rhotic (e.g. American) [ɻ] rather than other types
b. intervocalic /t/ rather than a tap [ɾ]
c. most substitutions of /θ/, /ð/, and dark /l/ allowable
d. accurate estimates to core consonants generally permissible
e. certain approximations not allowable – i.e., where there is a possibility that they will be miss-heard as a different consonant. (E.g., Spanish use of [β] for /b/, which can be heard as /v/ in e.g. *habit* (/hæbɪt/), sounding instead like *have it* (hævɪt.) (Setter, 2008).

2. Phonetic requirements

a. aspiration following /p, t, k/

b. pre-fortis clipping: A fortis (voiceless)sound following in the same syllable causes the preceding vowel to be shorter than it would be in other environments. Thus, for example, in many accents of English the vowel in *beat* is shorter than that in *bead*. In English, this sort of clipping is an important cue to the voicing status of a following consonant.

3. Consonant clusters

a. initial clusters not simplified

b. medial and final clusters simplified only according to English rules of elision

4. Vowel sounds

a. maintenance of vowel length contrasts

b. L2 regional qualities permissible if consistent, but /ɜ:/ to be preserved.

5. Nuclear stress production and placement and division of speech stream into tone units/word groups. (Setter, 2008).

The purpose of this list that is referred as the LFC (Lingua Franca Core) is to identify which characteristics of English pronunciation make a sensible difference while communicating in international contexts using English language as a lingua franca, i.e., among non-native speakers. Jenkins (2000) appealed us to understand that the LFC "is neither known as a pronunciation model nor as a restricted simplified core" (p. 158), but instead she describes the features of English pronunciation which will make first language speakers (L1) backgrounds more intelligible to each other.

According to that perception, it does have an obvious demand to pedagogies in pronunciation teaching, even though it is not without its critics; see the volume by Dziubalska-Kołaczyk & Przedlacka(2005), which contains many papers on this topic. It is possible to see how an LFC based approach gets compared to a traditional approach for choosing pronunciation precedence for a particular language by considering Walker (2001), which compared a list of difficulties of Spanish speakers of English through contrastive analysis, collected from O'Connor (1967), Kenworthy (1987) and Taylor (1993), with the LFC. Nearly all the difficulties that are relating to vowels, as well as those which are denoted as great importance by Kenworthy (1987),

are not listed as challenging in the LFC – with the exclusion of vowel length variation. Similarly, most difficulties in stress, rhythm, and intonation emphasized by O'Connor (1967), Kenworthy (1987) and Taylor (1993) are not demonstrated in the LFC, the only one that is being highlighted is nuclear stress location, which has no comparison in Spanish. Consonants and consonant clusters, though, are different matters; the most of the complications mentioned in O'Connor (1967), Kenworthy (1987) and Taylor (1993) are also found in the LFC. The famous tendency of Spanish speakers to insert /e/ before /s/ clusters is difficult for any teacher who is working on pronunciation with Spanish speakers, and typically it causes a negative transfer from the L1 to the L2, which is not considered as problematic from the viewpoint of non-native speakers' interactions. However, it could be concluded that, a teacher can base his/her classes on the priorities of LFC instead of a full list such as that gathered by Walker, which leads to spending more time on specific areas of difficulty and it would make a change in intelligibility in an international setting and other issues, which are based rather on OVEs norms. Walker (2001) concludes that "what is in fact required is an inversion of the standard, negative attitude towards the learner's L1 when teaching monolingual groups" (p.8)

It has become outdated to declare the Older Varieties of English (OVEs) like Received Pronunciation(RP) or General American (GenAm) as a pronunciation model in this era of global English. American English (variously abbreviated as GenAM, AmE, AE, AmEng, USEng,), is the set of varieties of the English language native to the United States (Crystal, 1997) and widely adopted in Canada whereas Received Pronunciation (RP) is the accent of Standard English in the United Kingdom (McDavid, 1965) and is defined in the Concise Oxford English Dictionary as "the standard accent of English as spoken in the south of England" (Pearsall, 1999) although it can be heard from native speakers throughout England and Wales.

There are several reasons for this, the least of them is that the imposition of any variety of language is same as linguistic imperialism. Whatever the target accent is, should be the choice of the individual himself/herself. Even though, in practical contexts like school situation at least, this is often applied through governmental language policy. Many speakers do still struggle to sound like a native speaker accent such as RP or GenAm, and this is their choice of preference. However, for most of the

non-native speakers, a native-like accent may be neither necessary nor desirable. The key fact is that as long as the speaker's intelligibility is not compromised it should not be important what accent or variety a speaker is using in his pronunciation. As Parashchuk (2000) said, "one of the conditions for successful intercultural communication is a certain basic degree of similarity in different varieties of English" (p. 2). The LFC specifically aims at features which may cause unintelligibility in international contexts, and for the same reason, it is an extremely sensible place for English language teachers and learners to start. (Setter, 2008)

To the extent that teachers are concerned, there is a certain necessity to achieve a clear English pronunciation. Local reasons which cause unintelligibility in pronunciation need to be rectified. An in-depth understanding of English phonetics and phonology and of one's L1 are therefore highly important so that the specific choices of language can be made which capitalize on the basic premise of the LFC.

2.4. Recent Materials

Materials for teaching and learning pronunciation are currently available on the various range like those which offer an approach based on OVE models to those giving emphasize on a more global perspective, and those based on time-honored tradition. Recently, English pronunciation writers have involved the use of the audio CD and web-based teaching in their methods of teaching pronunciation. Pronunciation is indeed a difficult area of study for classroom-based contexts and also self-study, using a textbook alone; although materials have been accompanied by audio cassettes, and reel-to-reel tapes for decades, the fresh technologies in media such as; portable mp3 players, laptops, online podcast are now available, and they enable pronunciation teaching to be much more effective, immediate, interactive, and accessible to the English language learners. In the following section, some of the more recent materials for pronunciation teaching and learning which are available on the market will be presented, and they may be used either for classroom use or self-study purpose. (Setter, 2008)

2.4.1. Books

- **The English Pronouncing Dictionary**

A pronunciation dictionary is a simple tool which is occasionally effective as a way of resolving a problem for most people involved in pronunciation teaching, or it

may be used a source of words for exercise matter; for a small number of followers, though, the role of a pronunciation dictionary is more than that, as it can be used as a representation, or codification, of a standard accent of the language. In fact, all dictionaries aim to achieve this special status of "setting a standard". Thus it is very important that the contents of a dictionary should be reviewed and updated on a regular basis. When dictionaries were type-set by hand, making changes used to be slow and expensive, but nowadays computer technology has made it easy to update the contents of dictionaries systematically and much faster. (Setter, 2008)

- **English Intonation**

Wells (2006) in his recent book uses the audio material on CD to take English intonation to real life, taking a relatively traditional approach to intonation targeted at the learner of English. The material in this book is presented visibly and breaks what is known as a complex area into easily right pieces that build into a functional description of English intonation, besides there is a good amount of practice material and plenty of examples as well. Wells' main target is the use of the tone, tonicity, and tonality. Tone refers to the movement of pitch on the nuclear syllable. Wells focuses on three tones only: fall, rise, and fall-rise. Tonicity is about the placing of the nucleus, it is also sometimes referred to as focus. Tonality deals with, breaking or chunking the flow of speech into meaningful groups. The aim is to look at intonation from the aspect of grammatical and discourse meaning before going on to finer differences in intonation patterns. Statements, questions, focus, and phrasal verbs are all focused on enabling the learner to use intonation to signal meanings at different levels. For a student who is enthusiastic to improve his/her intonation right, this is an excellent place to start.

- **Pronunciation Practice Activities**

As mentioned before, pronunciation is often ignored in language teaching classrooms and perceived as a difficult subject by both teachers and learners. Hewings' (2004) *handbook for teachers* pursues the format of a very common book *Grammar Practice Activities*, Ur (1988) and other books in the series brings pronunciation in a well-planned, unthreatening sized chunks to the teacher and student. Hewings (1993) have also previously authored the textbook *Pronunciation Tasks*.

Hewings (2004) begins with a brief introduction to the area of phonetics, phonology, and pronunciation for teachers, as a background for the activities which follow. That is followed by a section in which he asks teachers to reflect on what level of proficiency a teacher and a student should be targeting for (pp. 11-13), asking questions such as “In what frameworks will your students mostly be applying English after the course?”, and “Do your students show a desire to speak English with a particular pronunciation?”. It can be understood that gradually both teachers and learners realize that it is important to be intelligible to other speakers rather than speaking English with an OVE accent. Hewings (2004) provides easy-to-follow lesson plans and printable materials along with an audio CD for teachers willing to conduct pronunciation activities in their classrooms. Topics in these lesson plans are diverse ranging from those which aim to improve awareness of English pronunciation (e.g. differences between the learner’s L1 and consonant clusters in English; pronouncing names; comparing slow and quick speech) through to problems in individual speech sounds, and how pronunciation interrelates with grammar and spelling. According to level rating, the suitable material, the time that takes to finish the activity, and a note on what preparation is required have been provided in the book. There are also some useful pronunciation quizzes, both for common problems and more specific concerns, and appendices specifying information such as problems specific groups of learners might have word stress rules, and how do the consonants combine in clusters. The audio CD contains different example of pronunciations that use OVE and Southern British English, but Hewings remarks that this CD is not necessary and that the recordings on it should not essentially be considered as a target model (Hewings, 2004).

2.4.2. Web-based Materials

- **Sound of Speech**

Designing teaching materials for the student from the computer generation requires a lot of thought, imagination, and ingenuity. *Sound of Speech* is a web-based application which demonstrates these characteristics at every click of the mouse. *Sound of Speech* aims to help advanced or intermediate learners of English in learning and listening to the fast speech (200-500 words per minute) and be capable of tracking it more efficiently. They can become more fluent by learning about the spontaneous speech. It uses the above mentioned techniques to keep listeners interested in learning

skills such as applying filled pauses to buy time. The demonstration is very striking, with attractive graphics, an easy-to-use toolbar on the left-hand side of the window, pop-ups containing suitable information at significant points, clear English with glossaries for less popular words and sentences, and a layout which is highly accessible. (Setter, 2008).

The original British version starts with an introduction, and then it contains ten chapters, each chapter addressing a diverse aspect of fast, connected speech. The first eight chapters are hosted by eight of the author's colleagues – four females and four males– with the last two using the speech of a variety of these colleagues in workshops on sounds and suprasegmentals. First eight chapters contain the following format each; an introduction to the speaker and a topic followed by listening activity. The activity aims at the quickest important sections i.e. focus on those sections of the recording that contain the answers. By looking at how fast the speaker was speaking in words per minute, focus on speech features in the recording, focus on sections, work on "Sound of Speech" (trying out fast, connected speech); and to end with, a review section, telling the student what has been attained in that chapter. As well as providing answers in certain parts, it is probable for the student to record her/his voice and give a self-evaluation in some of the sections of each chapter.

The technique used for "Sound of Speech" in Section 4.4 proves Cauldwell (2005) himself makes it sound very clear and approachable for English learners. The student is directed (Offered in a pop-up) by placing a pause between each two words, and then slowly increasing speed, rhythmic pattern and other features of connected speech until his/her speech equals with the target section. Then the student can record her/his voice and compare it to the target. The capability to listen and evaluate one's version in comparison with a native speaker is an outstanding feature of these materials, as it is not often easy to self-monitor in an independent learning situation. Here, it is made easy to use – as long as the student has a microphone somewhere on his/her computer.

Recent updates to this on-line teaching material brought about a North American English version as well, and there are other courses which are available on listening and accents of English from around the British Isles, North America, and the world. Due to little available material on teaching listening using anything other than standard OVEs, *Sound of Speech* is one of the leading learning material.

- **The Sounds of Spoken Language**

There has always been this concern that where the learners of English pronunciation can get materials which demonstrate the making of speech sounds with a video image of the person speaking. For the purpose mentioned above, The University of Iowa (2001-2005), hosted this website which is a multi-media pronunciation *tour de force*. By selecting "American English", the student can pick any speech sound from that language, and he/she can see not only an animation of the vocal tract when that sound is uttered but also a step-by-step description of the creation of the sound. There is also a video clip showing a real speaker producing the sound is available, along with keywords in orthographic and phonemic transcription with related sound files. The website provides striking graphics and easily accessible user interface. Spanish and German are also available, but there is no British English version at the moment.

- **Plato and Toni**

These two websites on English intonation are very easy to use and depict aspects of tonicity and tone in a very clear, accessible and amusing way. PLATO (Maidment, 2000a) which stands for "Place the Tonic" is about listening to a series of statements one by one, the student selects the correct tonic syllable (or nucleus) in an orthographic representation using arrow buttons on top of the screen. The answer is then available, and the student can listen again to the utterance if willing to discover where he/she went wrong. Nucleus placement has been recognized as a vital element in intelligibility in English, and this website instructs the student effectively. By contrast, TONI (Maidment, 2000b) is intended to help the listener in identifying tones in the English language. The learner listens to a sentence, choose the tone used and is then provided with instant feedback. Both websites are presented with clear graphics and are greatly beneficial for teaching students how intonation can be applied in English.

These websites mentioned above, are just two in a suite of web tutorials available at www.phon.ucl.ac.uk, which is a rich linguistic and phonetic resources. The visitor can download phonetic fonts, programs for evaluating speech, speech data, and also they can read information and tips on different topics regarding phonetics and speech.

So we can say that pronunciation teaching theories and pedagogies are improving and, could be moving in a direction to achieve intelligibility. With the vast, diverse and accessible materials provided in the form of books, E-books, Audio CDs, online materials and so forth, one can hope as a pronunciation teaching professional that this significant area of study will be brought back into classrooms. This area of study has been missing and strengthened in classrooms where the enthusiastic teachers already teach it. However, the materials stated here represent a selection based on own personal choice, and there are many other publications available.

2.5. The Significance of Teaching and Learning Pronunciation

Pronunciation is one of the most important parts of learning a second language (Pennington, 1996); thus speaking skills play a major role in acquiring and using a language (Dan, 2006). Dan claims that language competence covers many aspects. Theoretically and practically, phonetics set up the basis of speaking above all other aspects of language and pronunciation is the base of speaking. Correct pronunciation may lead to an easier, more relaxed, and more useful communication.

Within the field of language teaching, ideas on the value of teaching pronunciation are often different. Some assert that teachers cannot do much to affect the natural path of English phonological growth with its often less than acceptable results. Arguments against the clear teaching of pronunciation are dependent on two essential assumptions about the acquisition of second language phonology (Jones, 2002). Firstly, it is not practically possible for adults to attain native-like pronunciation in a foreign language (Burrill, 1985). This idea is sustained by Guiora, Brannon, and Dull (1972), Elliot (1995), Major (1987), and Oyama (1976) pointing out that factors such as age, personality, intellectual style and native language phonology have been presented to have an impact on learners' pronunciation. Secondly, the work of Krashen (1982) discusses that pronunciation is an acquirable skill and its focused instruction is at best unusable and at worst detrimental.

Others assert that the role of teaching can be considered very significant in helping learners to develop their pronunciation capability and shaping their approach toward the importance of pronunciation (Richards & Renandya, 2002). The effectiveness of teaching pronunciation is also a broadly debated subject in the language teaching framework. Fraser (1999) concluded that most ESL teachers come

to an agreement that intelligible pronunciation teaching is a vital part of language teaching courses and confidence with pronunciation make learners capable of communicating with native speakers, which are crucial for all features of their linguistic development.

The field of development research signifies that teachers can bring about a remarkable change if some certain criteria, such as the teaching of the relating pronunciation and suprasegmentals to listening practice, are fulfilled. Pronunciation teaching has a tendency to be interrelated to the instructional technique being used. Pronunciation was almost unrelated and hence rarely taught in the grammar-translation technique. With the increasing need for more holistic, communicative methods and approaches to ESL instruction, pronunciation is lectured within the framework of factual communication (Celce-Murcia, Brinton & Goodwin, 1996; Morley, 1991). It is the effective pronunciation teaching that provides learners a genuine choice in how they express themselves (Fraser, 1999). Carter and Nunan (2001) explain the difficulty of the development of second language acquisition as an organic rather than linear process and students should begin pronunciation training classes early and carry on through high-level Academic English levels. Moreover, pronunciation teaching techniques need to more fully address the difficulties of motivation and exposure by building awareness of the importance of pronunciation and providing more contact to input from native speakers (Jones, 2002).

Pronunciation is the base of speaking. English language, in both forms of written and spoken, has been recognized as the first means of communication for majority of the people of the world but some misunderstandings have been caused by incorrect pronunciation (Yong, 2004). Weak pronunciation can lead learners to less social, academic and work advancement than they deserved (Fraser, 1999, 2000). A proper pronunciation may make the communication easier and more relaxed and thus more successful (Dan, 2006). Almost all learners believe that pronunciation is a priority and they need more guidance in this area of language (Willing, 1993; as cited in Australian Bureau of Statistics, 1997). Even though the study of foreign accents has always been attractive to some researchers, but the importance of pronunciation teaching and oral skills have been neglected in foreign and second language classrooms on the list of priorities (Peterson, 2000).

The 16th Educational Conference held in Melbourne in 2003 by Germana ECKERT, Insearch Language Centre regarding Productive Skills in the Academic English Curriculum proved that the main emphasis of the contemporary academic English curriculum is less about pronunciation work. There are two main reasons for this. First is the importance of having a good writing skill in the context of academic English. In such situations, students quickly learn that writing skill is considered to be more important than any other skills as it is weighed more in most tertiary institutions in Australia. Teachers in classrooms spend much time on teaching the students to improve their writing and grammar skills to make the students prepared for written exams. The second important factor is the time factor which leads the students and teachers to leave little time for pronunciation practice activities in the classroom (Germana ECKERT, 2003)

Gilbert (1994) claims that: "Pronunciation has been something of an orphan in English programs around the world. Why has pronunciation been a poor relation? I think it is because the subject has been drilled to death, with too few results from too much effort." (p. 38).

Most of the studies on pronunciation are about what to teach and how to teach, while the learner is a silent abstract in the classroom. Morley (1994) points out that the dominant attention on pronunciation teaching nowadays should be on planning new wave of instructional programs.

In addition, she emphasizes that these instructional designs should take into consideration not only the language forms and functions but also learner 's issue of self-involvement and strategy exercise. In other words, students who have managed to develop the skills to observe and revise their speech forms if necessary should become active companions in their own learning. Yule, Hoffman, and Damico (1987) state that self-monitoring is crucial for creating independent and proficient learners and is an essential part of the awareness raising process. Finally, expansion activities are prepared for students to merge the language in their own practice (Harmer, 2001; Celce- Murcia, 1991; Richard-Amato, 1988; Krashen, 1987).

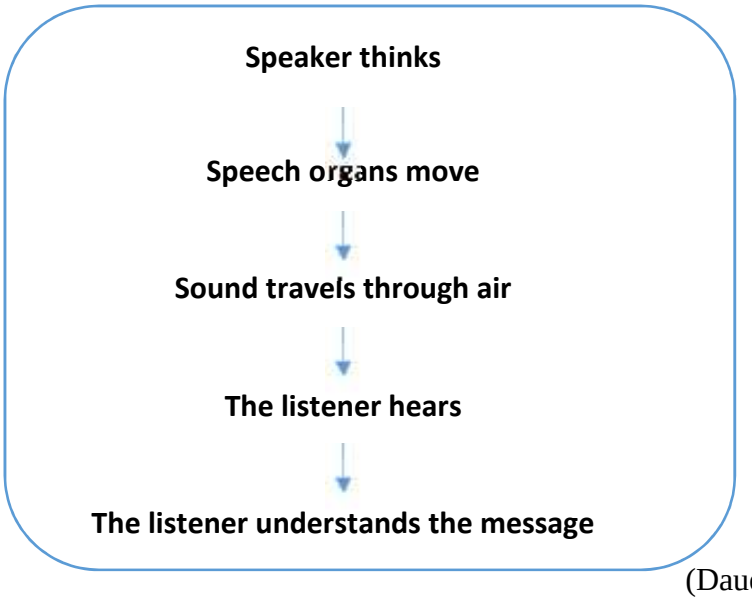
Kriedler (1989) states that correct and clear pronunciation are significantly counted as key factors in language learning. Without them, learners may not sound intelligible and may be less understood by other English speakers. They should be

confident enough in their vocal ability. It takes time to acquire and build a real and intelligible pronunciation, as there are several factors involved. Learners should hear a lot of English before they can start a feel for English sounds. The learners may get more confidence and motivated in learning the language because of the teaching assistances and materials such as tape recordings of native speakers, pictures of mouth and articulations. These materials are used in the class along with the provision of positive reinforcement (Phinit-Akson, 2002; Quilter, 2002; Eatrada & Streiff, 2002; Wu, 2002; and Jay, 1966)

Pronunciation is a very significant factor in the process of speech (spoken language) when the speaker succeeds in communicating effectively by being understood. Speech is a process that includes several steps, starting with the speaker's thoughts and ending with the understanding of those thoughts by the listener (Dauer, 1993).

Dauer (1993) states that the speaker thinks and decides what he or she is going to say and converts the thoughts into words and sentences of a certain language. The speaker's mind then transforms the words and sentences into nerve impulses that it sends to the muscles in the speech organs. The speaker's speech organs then move. The lungs then send the air up to the mouth and nose through the larynx. The tongue and lips give the air shape and then send it out of the speaker's mouth as sound waves. The sound moves through the air. Sometimes, the sound is transformed into electrical signals, such as a telephone or a tape recorder, and then is transformed back into sound waves by an electronic speaker. The listener hears the sounds when the sound waves hit his or her eardrum. The ear converts the sound waves into nerve impulses and drives them to the brain. The listener understands the message. The listener's brain recognizes particular speech sounds, understands them as words and sentences of a specific language, and figures out their meaning (Figure 2.1). The importance of an intelligible pronunciation begins with the process of the speech organs movement (pronunciation) which is related to the expertise of the speakers until the movement of the sounds through the air.

Figure 2.1 Speech Process (spoken language)



(Dauer, 1993)

Dauer (1993) claims that at any stage of this process, there could be an issue that may lead the listener not understanding the message that is intended by the speaker. Successful oral communication depends on accuracy in all stages. The articulation of certain sounds is included that the listener detects some speech sounds incorrectly or determine a different meaning from the one that was intended by the speaker. Problems are listed as follows:

- The speaker does not know the appropriate words or grammar pattern to set his or her idea into the language.
- The speaker cannot produce a certain sound.
- There is a bad telephone connection or noisy background.
- The listener cannot hear properly.
- The listener recognizes some speech sounds incorrectly or understands a different meaning from the one intended by the speaker. (Dauer, 1993)

Research has contributed some key data on elements that can have an impact on the learning and teaching of pronunciation skills. Graham (1994) and Goodwin (1996), Celce-Murcia, Brinton Gillette (1994), and Pennington (1994) discuss age and native language. They come to an agreement that adults face more difficulty in learning pronunciation than children do and that they may not succeed in achieving native-like pronunciation. Nevertheless, proficiencies and experiences in language

learning and the ability to self-observe, that improves with age can minimize these limitations to some extent. These experiences consist of the amount and type of earlier pronunciation instruction. Earlier experiences with such pronunciation instruction may lead the learners to succeed with current efforts. Learners who are at higher language proficiency levels may start developing frequent and regular pronunciation errors that must be recognized and rectified. The capability to identify and adopt foreign sounds may not be equally settled in every learner. Learner attitude and motivation related to a person's character and learning goals can affect achievement in pronunciation. The approach toward the target language, culture, native speakers, the degree of exposure, use of the target language, personal identity issues, and enthusiasm for learning the language can all support or delay pronunciation skills improvement.

2.6. Different Notions of Pronunciation Teaching in Classroom.

Teaching proficient pronunciation has got more emphasis in recent years especially in ESL/EFL classrooms. That is the result of the increasing realization that poor pronunciation can bring about serious problems for learners, such as communication failures, nervousness, stereotyping and discrimination (Morley, 1998). Despite that English pronunciation is being ignored in classrooms throughout the world today, including Asia. The reasons are because there are not many English pronunciation teaching techniques or strategies available for teachers in the classroom (Wei, 2006). Lu (2002) concluded that learners of ESL in Hong Kong have poor English pronunciation because they lack knowledge of English sounds. There is not much training in using phonetic symbols in the curriculum. Besides, English pronunciation teachers do not get appropriately qualified training in the use of phonetic symbols. The reason is not the lack of interest in teaching pronunciation, but ambiguity in the best ways to help learners' pronunciation is one of the most problematic areas for learners as well as teachers (Fraser, 1999).

There are two contradictory opinions on the teaching of pronunciation in the ESL classroom (Avery & Ehrlich, 1992). One opinion claims that the purpose of teaching pronunciation is to eliminate all remnants of a foreign accent through pronunciation training. The other view says that pronunciation teaching is ineffectual after a certain age due to a decreasing skill among learners to develop native-type pronunciation in a second language. Avery and Ehrlich (1992) assert that none of

those views is absolutely precise. Factors that should be considered as effective on the learning the sound system of a second language are biology, socio-culture, personality, and linguistics. These factors could avoid learners from making native-like pronunciation while speaking in a second language, so it is important that teachers must set realistic goals. Kachru (1990, 1992) and Kachru and Nelson (1996) recommend English language teaching experts to consider circumstantial realities before using pedagogic models of global English; language education should reveal how the language is going to be utilized in that particular society. Jenkins (1998) advises that concept of a learning model is still restricted to the category of native varieties rather than embracing all diverse varieties of English to avoid possible misunderstanding and conflict in their language learning.(p.120).

Gillette (1994), Celce-Murcia, Brinton, and Goodwin, (1996), Pennington (1994), and Graham (1994) agree that the learner's native language affects the pronunciation of the target language and it is a major factor in accounting for foreign accents. Negative transfer or interference from the first language is probably to cause errors in desire, rhythm, and intonation in the target language and pronunciation of the plain formation of the vowel or consonant.

Fraser (1999) added that in the mission for effective teaching, it is beneficial to diagnose carefully the nature of the problems that may come across. There is a significant skill element for learners. Pronunciation is not just an intellectual matter, it is a physical matter too, similar to playing a sport or musical instrument. Learners need desire and time to actually practice pronunciation. It is very helpful to spend class time in discussing with learners about their own views on what is involved in learning pronunciation. Lu (2002) asserts that learners recommend that they should practice speaking. Learners need support for overcoming their expectation that pronunciation can be learned by listening to a trainer, and the social and psychological obstacles that cause difficulty to practice efficiently. Moreover, there is also a remarkable cognitive factor in the process of pronunciation learning, which is less often known. It is useful to consider learning to pronounce a new language as relating a type of concept formation rather than as an only physical talent. The teachers must pay attention to two areas. Firstly, learners must know the aspects of their pronunciation that causes other people not being able to understand them. Secondly, learners must get the opportunity to practice different aspects of the English sound

system which are crucial for their improvement (Avery & Ehrlich, 1992). Firth (1992) said that learners' accomplishment of a near perfect standard might vary from one person to another person in the degree of motivation, sensitivity to accuracy, age and education factors which are beyond a teacher's control.

However, teachers should concentrate on the development of self-correction skills and self-monitoring strategies. Self-correction is about the skill to correct oneself when teachers or peers have recognized a pronunciation mistake. It is important that the teacher should help in improving those strategies which would enable the learner to self-correct and self-monitor. It can be implemented by concentrating on motivation (learners should come to an understanding that why accuracy of verbal communication is so important), explanations (description and demonstration suitable for proficiency levels), practice (satisfactory number of opportunities to practice) and feedback (get helpful and precise feedback from teachers and learners in class).

The status of pronunciation in schools of language teaching has been widely different from having almost no part in the grammar-translation method to being the central attention in the audio-lingual method where the emphasis is given on the traditional concepts of pronunciation, minimal pairs, drills and short conversations (Castillo, 1990). Situational language teaching, which is established in Britain, also reflected the audio-lingual notion of the pronunciation class (Richard & Rodgers, 1986).

Morley (1991) states:

> "The pronunciation class…was one that gave primary attention to phonemes and their meaningful contrasts, environmental allophonic variations, combinatory phonotactic rules, and pronunciation of the basic formation of vowel or consonant, etc., along with…attention to stress, rhythm, and intonation." (p.484)

During the late 1960s and the 1970s, there were questions about the status of pronunciation in the ESL/EFL curriculum, whether the programs and the instructional methods were effective or not. Pronunciation programs were believed to be "meaningless non-communicative drill and exercise gambits" (Morley, 1991, pp.485-486). In many language courses, the teaching of pronunciation was neglected, as

several studies came to the conclusion that there is little relationship between teaching pronunciation in a classroom and achieved skill in pronunciation. The strongest elements found to be effective on pronunciation, i.e. native language, and motivation appeared to be irrelevant to classroom activities (Suter, 1976; Suter & Purcell, 1980).

Suter (1976) and Suter and Purcell (1980) concluded that pronunciation training in the class had little influence on the learner's pronunciation abilities. The achievement of an accurate pronunciation in a second language acquisition is a matter substantially beyond the control of teachers. They qualified their results by saying that variables of formal training and the quality of the training in pronunciation could have an impact on the results. The area of pronunciation also would have the same impact that had been given importance, that is 'segmentals' (individual sounds of language) or 'suprasegmentals' (the 'musical patterns' of English, melody, pitch patterns, rhythm, and timing patterns) (Gilbert, 1987).

Pennington stated that there was "no firm basis for asserting categorically that pronunciation is not teachable or that it is not worth spending time on…" (1989:203). Pennington (1989) questioned the validity of Suter and Purcell's findings as the elements of formal pronunciation training, and the excellence of the teaching could influence any research findings. Also, Stern (1992) stated that "There is no convincing empirical evidence which could help us sort out the various positions on the merits of pronunciation trainings" (p.112).

If the above visions prove a splitting in pronunciation teaching, what the teacher should do to enhance their students' pronunciation if improvement can be obtained? Jones, Rusman, and Evans (1994) concluded that students with past experience with phonological guidelines and principles, although they may not always make more accurate pronunciation, seem to be better prepared to evaluate their own speech and to be more conscious of their specific problems.

Changing views on language learning and teaching have affected methods of teaching from teacher-centered to learner-centered classrooms. Within the educational field over the last few decades, there has been a gradual but noteworthy shift has taken place, leading to less stress on teachers and teaching and greater stress on learners and learning. This change has been imitated in various ways in language education and applied linguistics. It ranges from the Northeast Conference paper

(1990) entitled ‘Shifting the Instructional Focus to the Learner an annual Learners’ Conference’ held in collaboration with the TESL Canada convention since 1991, ‘Key works on the learner-centered curriculum’ (Nunan, 1988, 1995) and ‘Learner-centredness as Language Education’ (Tudor, 1996).

Simultaneously, there was also a move from particular linguistic competencies to wider communicative competencies as goals for teachers and students (Morley, 1991). Morley states the need for the combination of pronunciation with verbal communication, with more highlighting from segmentals to suprasegmentals, more emphasis on separate learner essentials, and expressive task-based training and presenting peer correction and group collaboration (Castillo, 1990). Research has proved that teaching phonemes are not enough for enhancing intelligibility in communication (Cohen, 1977). With stressing on intelligible communication and Morley’s (1991, p.488) premise, that “intelligible pronunciation is an essential component of communication competence”, teachers should contain pronunciation in their language courses and encourage them to do well in it. Without adequate pronunciation abilities, the learners’ capability in communication is strictly limited. Morley (1991) says that not attending to a student’s need is an end to professional responsibility. Other research supports Morley’s (1991) vision of the necessity for professional responsibility when a given non-native speaker’s pronunciation drops below the level in which he or she will be able to communicate verbally with no consideration on how acceptable his or her use of English grammar and vocabulary might be (Celce-Murcia, 1987). Gilbert (1984) holds the idea that the listening skill comprehension and pronunciation are interdependent so that if the speaker is not able to hear English well and cannot be easily understood, they will be detached from a conversation with native speakers. Nooteboom (1983) also has recommended that production of speech is influenced by speech perception; the hearer is an essential element in communication discourse. That explains the necessity to join in pronunciation with communicative events to provide the students situations to make progress in their pronunciation skill by performing listening and speaking tasks.

The current researches and trends reversal in the thinking of pronunciation illustrate that there is a general agreement that the learner’s pronunciation in a foreign language should be taught in unification with communicative performances for the

learner to make him or her capable to communicate efficiently and intelligibly with native speakers.

2.7. Different Features of Language Involved in Pronunciation

Pronunciation training comprises micro-level skill (accuracy-based learning), macro-level skill (fluency-based learning) and awareness-raising classroom activities. At the micro-level skill, learners should be taught both in and suprasegmental (training in stress, intonation, rhythm, and linking) and segmental (a study of sounds features) (Morley, 1979, 1991; Gilbert 1984 and Wong, 1987). Celce-Murcia, Brinton, and Goodwin (1996), Gilbert (1990), and Morley (1991) define segmentals as the core inventory of typical sounds and show the way that they mix to create a spoken language. This inventory comprises 40 phonemes (15 vowels and 25 consonants), in North American English, which are considered as the basic sounds that are used to differentiate words from one another. Pronunciation training has often focused on the mastery of segmentals through discrimination and making target sounds by drills consisting of minimal pairs.

Segmentals and suprasegmentals outreach the level of individual sound production and are created instinctively by native speakers. However, suprasegmentals extend across segmentals. Since suprasegmental features offer essential context and support (they define meaning) for segmental creation, they are provided with a more prominent place in pronunciation training.

Suprasegmentals comprise stress, rhythm, regulations in connected speech, prominence, and intonation. Stress is a blend of length, loudness, and pitch applied to syllables in a word e.g. BEAUtiful, TAble. Rhythm is the normal, pauses and patterned beat of unstressed syllables and stressed; for instance with less stressed syllables in small letters and stressed syllables in the capital letter;

E.g. *they PLAY CRICKET every day.*

Regulation of connected speech is to modify the sounds within and between words in speech streams.

E.g. *call him/* becomes */calim/.*

Prominence is the speaker's act of giving importance to certain words to emphasize meaning or intent.

E.g. Bring me the RED pen (not the blue one).

Intonation is the rising and falling of voice pitch across phrases and sentences
E.g. are you REAdy?

There are, also, strong dissimilarities in the inflection of stress and intonation among the different district varieties of English e.g. American, Australian, Indian, and local UK dialects. Worldwide, English teachers denote in their teaching to the sounds, stress, and intonation of The International Phonetic Association (IPA).

Speech can be split down into pronunciation and intonation, accuracy and fluency or can be classified regarding approaches or it can be regarded as a form of interaction and examined by using the methods of pragmatics or discourse analysis. It signifies that the perfect speaker may communicate efficiently (Skehan, 1998). It should contain all aspects of English pronunciation, and the goal of pronunciation teaching is to foster communicative effectiveness (Wong, 1987).

2.8. Teaching Pronunciation to Achieve Comfortable Intelligibility

Morley (1991) says that the aim of pronunciation should be improved from the achievement of perfect pronunciation to a more realistic target in which it emphasizes on improving functional intelligibility, communicability, increasing self-confidence, enhancing speech observation abilities and speech modification strategies for using beyond the classroom environment. Abercrombie (1991) describes intelligibility as a pronunciation which can be understood with less or no conscious struggle on the part of the listener. Morley (1991) also says that the overall goal is for the learner to improve spoken English which is easy to understand and intelligible, helps the learner with her personal requirements, and reflects a positive image as a speaker of a foreign language. In addition, the learner requires to grow consciousness and observing skills that will allow learning chances outside the classroom. It is clear that making a more potent link between pronunciation and communication can increase learners' motivation by raising pronunciation to intelligibility level and it can also inspire learners' consciousness of his or her potential for making their language not only easier to be understood but more efficient (Jones, 2002).

Pronunciation is obviously a key factor in learners' achievement in making themselves understood (Elson, 1992). Morley (1991) also says that intelligible

pronunciation is a crucial element of communicative competence that teachers should incorporate their courses and expect learners to do well. The skill to apply stress, intonation, and articulation in a way that produces comprehensibility is an ability that for learners who possess many language backgrounds will only improve slowly. Elson (1992) strongly suggests that learners require being encouraged to engage themselves in the target language and to carry on despite the difficulties that they may face as they are part of the language-learning process. The experience of unintelligibility or incomprehension increases because of sensitivity to 'correctness' or the urge for successful communication in the target language. The speaker's self-image and sense of achievement are closely interrelated to intelligibility and being intelligible. The outcome can bring a high degree of frustration and disappointment to the speaker or listener who may encounter each moment of incomprehension as an own fault and responsibility. Klyhn (1986) notices that learners should know that every message they utter should be understood.

2.9. Importance of Language Learning Strategies in ELT.

Language learning and teaching have increasingly given importance and focused on learners and learning instead of teachers and teaching. Many types of research have been done to discover language learning techniques such as O'Malley et al., (1985 and 1990); Politzer & Groarty, (1985); Prokop, (1989) and Oxford, (1990). Along with this new change of interest, the way learners analyze new information and types of approaches they use to understand, learn, or remember the information has always been the main target of research dealing with the area of foreign language learning.

Language learning strategies are used by learners to perform speaking, reading, listening or writing tasks offered in language lessons. Knowing that there is a task to complete or a problem to solve, language learners will use whatever intellectual or effective social strategies they have to show up in the language learning activity (Oxford,1990, p.9). However, beginners may be less capable of choosing and applying strategies to activities (O'Malley & Chamot, 1995) though proficient language learners can deal with the problems in an organized manner and succeed in picking suitable strategies to finish a task. Regardless of language learning skills, both groups of learners will require instruction in how to use strategies proficiently as a technique to develop language learning and performance (Wenden, 1987; O'Malley &

Chamot, 1995; Cohen, 1998). It is necessary that both of the indirect and direct Language Learning Strategies (LLS) be interconnected, and provide support to one another (Oxford, 1990a, p.14).

Research into LLS started in the 1960s. Mainly, improvements in cognitive psychology had an effect on much of the research on LLS (Williams & Burden, 1997, p.149). In most of the research, the principal concern has been on recognizing what decent language learners describe they intend to learn as a second or foreign language (Rubin & Wenden, 1987, p.19). In 1971, Rubin began a research aiming at the strategies of successful learners and stated that these strategies, once identified, could be made available to less successful learners. Rubin (1975) defined learning strategies as the methods or devices which a student may use to gain knowledge. Oxford (1990) advanced a slightly expansive definition as "Learning strategies are steps taken by students to enhance their own learning."(p.24)

Weinstein and Mayer (1986) describe learning strategies (LS) broadly as "behavior and thoughts that a learner engages in during learning which are intended to influence the learner's encoding process" (p.315). Later Mayer (1988:11) defined LS as "behaviors of a learner that are intended to influence how the learner processes information." (p.11). These first definitions from the scholarly collected works reveal the roots of LS in cognitive science, with its important assumptions that human beings deal with information and that learning includes such information processing. Clearly, LS are entangled in all learning, despite the content and context. LS are applied in learning and teaching Math, Science, History, languages, and many other fields, both in the classroom and more informal learning settings.

Wong-Fillmore (1976), Tarone (1977), Naiman Frohlich, Stern and Todesco (1979), Cohen and Aphek (1981), Wenden (1982), Politzer and McGroaty (1985), Chamot and O'Malley (1987), Conti and Kolsody (1997) and many other writers studied strategies applied by language learners during the process of foreign language learning. Researchers have experimented with instructing language learners to use chosen learning strategies as a method of improving language performance. The positive outcome showed that students who had LLS training significantly did better than the students who were not trained (O'Malley & Chamot, 1995, p.68). Wenden (1987) stated that providing students with a worksheet of standards to self-assess their verbal production resulted in the efficient use of self-assessment as a learning

strategy. Cohen and Aphek (1980) and Ellis (2002) concluded that better performance in the recall of new words by using paired associations occurred when learners formed associations than when associations were not found.

The agreement of these investigations and others (Bialystok, 1983; Gagne, 1985; Dadour, 1996; Sano, 1999; Johnson, 1999) signifies that LLS are teachable and training the language learners to use appropriate learning strategies can have a positive impact on task performance and the language learning process.

Research by Robbins (1996) and Grunewald (1999) also provides awareness into instructional series and teaching methods. The research revealed the possibility of learning strategies instruction in Japan. Robbins (1996) offers a qualitative explanation of the instructional series used to apply strategy instruction at two universities in Kyoto. As an outline for strategy instruction, Robbins (1996) used the problem-solving process pattern. Grunewald's (1999) action research also offers empirical evidence of how strategies instruction has been unified into foreign language lessons. Grunewald as a teacher of German in a Japanese university designed an optional complementary system of useful LLS which were recognized for each language skill existing in the course book and were included in the weekly language programs. The teaching method used for strategies instruction included awareness raising, the clear naming of strategies, exercise, and self-evaluation and monitoring.

It is necessary to revise and study wider visions of language learning strategies to provide teachers more perception of students' learning and their further study on language teaching.

2.10. Learning Strategies and Learning Styles

O'Malley and Chamot (1990) described learning style as "the special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information" (p.1). On the basis of this definition, it can be understood that LLS are different from learning models that mostly refer to a learner's usual, typical, and the preferred way(s) of absorbing, processing and keeping new information and skills" (Reid, 1995, p.7). The strategies are used as specific behaviors that individuals use to help them comprehend, learn, or remember new information or skills (O'Malley & Chamot, 1990). Oxford (1990a) said that LLS make learners able to become more

self-directed, expand the role of language teachers, are problem-oriented, contain many characteristics not just the cognitive, can be taught, are flexible, and are influenced by a variety of elements. Vann and Abraham (1990) found proof that advises that both good and poor language learners could be keen users of the same LLS. However, both were short of what are called metacognitive approaches, which may enable them to evaluate the assignment and bring to bear the required strategies for its accomplishment.

Within the second language (L2) and foreign language (FL) education, several explanations of LLS have been used by well-known individuals in the field. Early on, Tarone (1983) defined learning strategies (LS) as "an attempt to develop linguistic and sociolinguistic competence in the target language to incorporate these into one's interlanguage competences" (p.67).

Other researchers have described the term LLS as follows:

- Any set of operations, steps, plans, routines used by the learner to facilitate the obtaining, storage, retrieval, and use of information (Wenden & Rubin 1987, p.19).
- Intentional behavior and thoughts used by learners during learning so as to better help them understand, learn, or remember new information (Richards & Platt 1992, p.209).
- A learning strategy is an attempt to develop linguistic and sociolinguistic competence in the target language (Faerch, Klaus & Kasper, 1983, p.67).
- The idea of learning strategy is dependent on achieving certain aims, and learning strategies can be considered as largely conceived intentional directions and learning techniques (Stern 1992, p.261).
- Finally, the structure of work in her book for teachers (Oxford, 1990a), Oxford (1992, 1993) provides clear examples of LLS and this helpful definition. "Language learning strategies are specific actions, behaviors, steps, or techniques that students (often intentionally) use to improve their progress in developing L2 skills. These strategies can facilitate the internalization, storage, retrieval, or use of the new language." Strategies are means for the self-directed involvement necessary for developing the communicative ability.

- An additional statement on strategy definition is given in Johnson (2001) “techniques for coping which learners develop in relation to strategic competencies” (p.18)

While processing new information and doing tasks in language training, every language learner uses LLS either knowingly or unknowingly. As the language classroom is similar to a problem-solving situation in which learners are likely to challenge new input and challenging tasks given by their instructors, learners try to find out the quickest or simplest method to achieve what is needed, that is, by using LLS. The concept of consciousness can be found easily in Oxford’s definition (1990). However, she does not say anything about consciousness in her definition. Cohen (1998) interrelates the intelligent use of learning strategies to the target which is the second or foreign language learning. Another claim brought up by Johnson (2001) is “…whether or not the word strategy should be confined to conscious action” (p.53).

According to mentioned definitions, a modification over time can be observed from the early emphasis on the LLS products (linguistic or sociolinguistic ability) to a greater focus on the developments and the features of LLS that are different from learning patterns. These features speak of mostly a learner’s normal, habitual, and desired way(s) of absorbing, processing, and recalling new material and abilities (Reid, 1995).

Although the word is not always recognizable, some researchers use the terms “learner strategies” (Wenden & Rubin, 1987), while others use “learning strategies” (O’Malley & Chamot, 1990; Chamot & O’Malley, 1995) and “language learning strategies” (Oxford, 1990a, 1996). There are numerous basic features in the commonly agreed view of LLS. Primarily, LLS are learner generated. They are steps taken by language learners. Secondly, LLS enrich language learning and help the development of language competence, as revealed in the learner’s expertise in listening, reading, speaking, or writing the L2 or FL. Thirdly, LLS may be observable through behaviors, steps, and techniques that may be unobservable like thoughts(mental processes). Fourthly, LLS consist of information and memory (vocabulary knowledge,and grammar rules). Some more features of LLS are obviously less consistently accepted. When talking over LLS, Oxford (1990a) and other authors such as Wenden and Rubin (1987) notice a tendency for control and independence of learning on learner part through LLS.

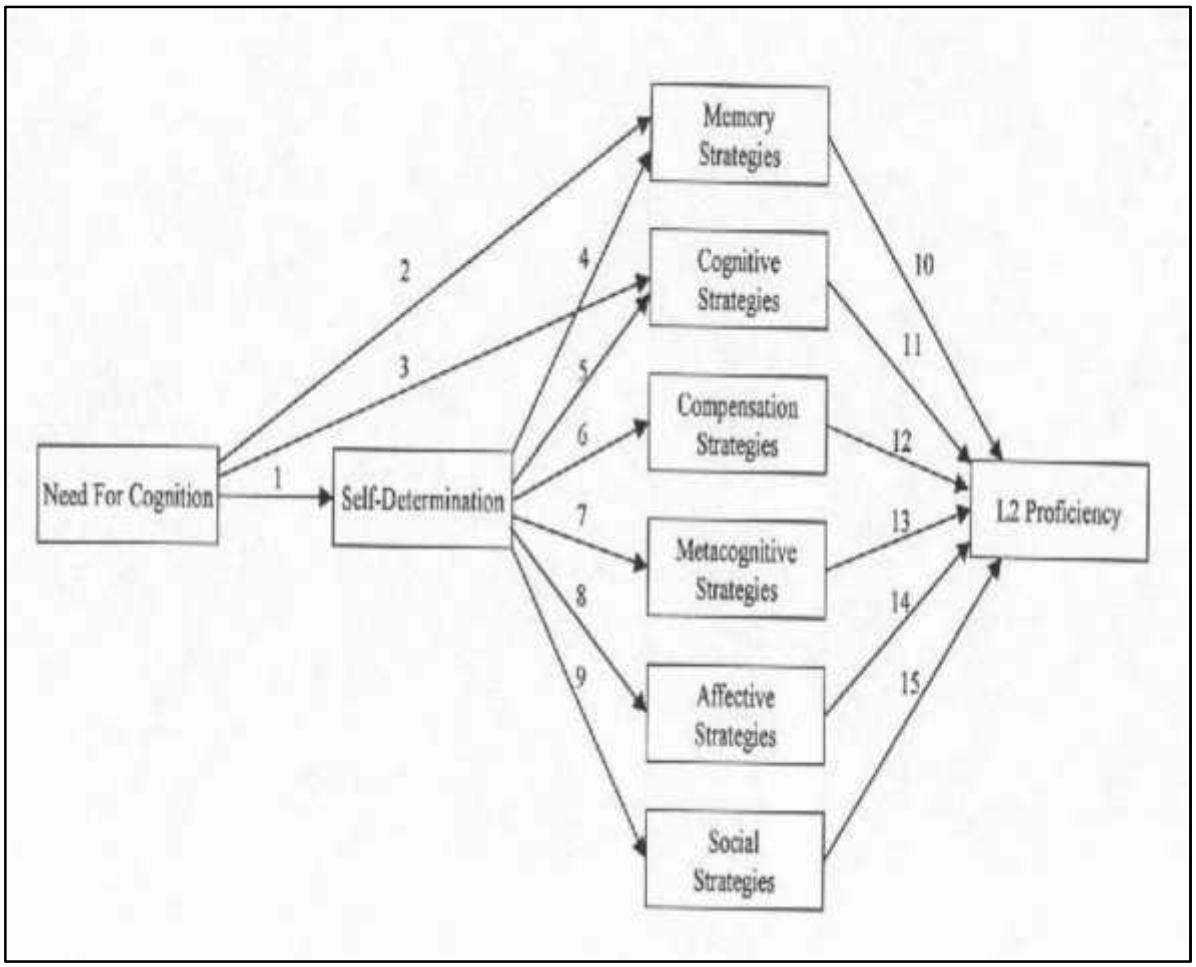
Oxford listed the advantages of LLS as follows:

- LLS let the learners feel more self-directed
- It enlarge the role of language teachers
- LLS are problem-oriented
- They involve many aspects, not just the cognitive
- They can be taught
- They are flexible
- LLS are influenced by a variety of factors (Oxford, 1990a, p.9)

Finally, Cohen (2003a) emphasizes the cognizant quality of language strategies again and says that language learning strategies and language use strategies are both forms of the wider term strategies. Strategy shifting from one language skill to another is an associated aim of LLS, as Skehan (1989) has talked about it. Skehan (1998) stresses though the capability of learners to shift the strategy may be different because of their memory capability and speed of logical processing with working memory.

In accordance with Skehan's (1998) discussion on LLS, a hypothetical process pattern was framed (McIntosh & Noels, 2004). Each numbered arrow shown in Figure 2.2 corresponds to language proficiency. Especially, the necessity for cognition in language learning will be clearly associated with self-determination. Self-determination in language learning correlated to all six forms of LLS and was positively linked to the use of memory and cognitive strategies. Arrows numbered 10 to 15 respectively shows that all six LLS will certainly help in L2 proficiency.

Figure 2.2: Theoretical Process Model for Study Variables



(McIntosh & Noels, 2004)

2.11. The History and Importance of Prosody in ELT

In linguistics, prosody (from Ancient Greek προσῳδία prosōidía [prosɔ:(i)día:], "song sung to music; tone or accent of a syllable") is about those elements of speech that are not only concerned with vowels and consonants (phonetic segments) but they also belong to syllables and larger units of speech. These includes as intonation, tone, stress, and rhythm as linguistic functions. Prosody may convey different features of the speaker or the utterance. For instance, speaker's emotional state; the form of the utterance (statement, question, or command); emphasis, irony or sarcasm, focus, and contrast or other elements of language that may not be explained by grammar or vocabulary choices.

As humans' most advanced means of communication, the code of language uses several formal devices to extract the meaning of the message across. When

words are strung together, the meaning which is the result of the whole structure is a function of the semantic properties of the individual lexical items and of the syntactic relations that hold among them. When someone is speaking, the vocal organs start moving to produce the sound pattern that can match the underlying linguistic elements. While producing the sound pattern, the speaker simultaneously articulates the continuous speech sounds that make up the utterance and controls other vocal features such as rhythm, loudness, pitch, and voice quality. The latter varieties do not shape the phonetic personality of the segmental speech-sounds, yet they constitute a genuinely 'suprasegmental' or 'prosodic' layer in the pattern of the sound. The prosody of an articulation adds an expressive measurement to the communication procedure by changing the prosodic characteristics the speaker can fulfill his expressions with elements of meaning that are not clearly explained in its vocabulary and grammatical form. This addition of meaning must be applied in a broad sense of communicatively relevant information. It may be given widely different paraphrases, such as: *this is the topic of my discourse*; *this is a polite request*; *I don't believe you*; *I am bored*; *I don't mean what I say*; *I mean the opposite of what I say*; *I emphasize this word; this is the end of my message;* etc. (Hart, Collier, & Cohen, 1990).

The importance and value of the Prosodic feature in the English language are evidenced by the fact that novelists and playwrights are frustrated by the inability of coding them in a typical orthography (a defect already taken up by J. Steele, 1775, 1779). It is also proved by the fact that the same text can be expressed in many different ways. The only possible ways for expressing prosodic are using punctuation marks, italics and capitals, which are believed to be inadequate means for expressing the meaning conveyed by prosody. They have to be written in plain words. Both linguists and phoneticians have come to this conclusion for a long time that prosody is a legitimate issue in their fields of interest, but they have also been aware that it is a relatively elusive subject matter.

2.12. Stress and Intonation as Prosodic Features of Speech

While learning a new language, the learners mostly focus on grammar. Richards and Renandya (2002) indicates that students do not learn English; they learn grammar. When learners utter certain sentences or writing them, they make errors either because their level of English is low or they have a high degree of proficiency but don't have much contact with the target language. The same case happens to the

teachers who teach English in the classrooms as they are also taught by teachers whose level of proficiency is good, but their speaking level is low. This kind of circumstance leads the teachers to face difficulty in uttering the correct intonation even when they are practicing their teaching job. Various reasons may cause the English teachers to lack proficiency level in intonation; some of them will be discussed below.

2.12.1. The Status of Stress in English

In English, the position of stressed syllables in the separated words is generally fixed. However, when we discuss sentence utterance, stress patterns are affected by the context in which component words are used. Generally speaking, in a sentence, content words such as verbs and nouns get stressed, and the function words like prepositions and articles are not stressed. However, several factors may affect the sentence stress, and there are several possibilities which often make intonation confusing the learners. In the English language, stressed syllables are determined by power level and pitch level, duration and vowel quality (Sugito, 1996). However, in a natural conversation, the pitch would rise quickly at the beginning of each phrase unit and then it falls gradually with a complex influence on the sentence stress. This kind of situation brings out the need for learners of English to get related courses to overcome the possible problems.

2.12.2. English as a Stress-Timed Language

Languages can differ regarding rhythm, and this is sometimes discussed in terms of syllable-timing and stress timing (Abercrombie, 1967, p. 96-98). In the ideal syllable-timed language, each syllable would spend the same duration of time, or be simultaneous, whereas, in the stress-timed language, it is the stress-foot which would be simultaneous (the stress-foot includes a stressed syllable plus any unstressed syllables which interpose before the next stress) (Nolan, 2008). According to the view above, Turkish and French are good examples of syllable-timed language. On the contrary, English is an excellent illustration of a stressed-timed language which implies that stress in a spoken sentence occurs at regular pauses and the duration of an utterance to say, is dependent on the number of stressed syllables rather than the number of syllables itself.

2.12.3. Word Stress in L1 and L2

This section studies the linguistic literature on word-stress and second language acquisition. The first studies the extent to which native speakers rely on word-stress while working out the spoken language. The second section studies research on the connection between word-stress in L1 and L2. The third section reviews whether second-language learners take advantage from word-stress training. The fourth section deals with stress rules in English. Finally, the last section studies a series of chosen textbooks that are about word stress in English.

- **Word-stress and L1**

The primary concern here is to understand whether or not English native speakers rely on stress to comprehend the meaning of what is uttered. While it is obvious that sentence stress does play a role in dialogue (as in sentences such as: “BEN ate all of it” vs. “Ben ate ALL of it), the answer is not as straightforward when it comes down to word recognition. Word stress is the visible part of lexical entries, but it does not essentially mean that it affects the word recognition. In order to identify whether or not stress is a source of information for English native speakers to recognize words, researchers have undertaken this question by directing tests where participants were requested to complete shadowing tasks (Slowiaczek, 1990) or with word-spotting tasks (e.g. Sanders,Neville, & Woldorff, 2002).

In the shadowing task, native speakers were asked to restate words as quickly as possible after they hear them. The list of words that they were given contains two types of words; properly-stressed words and improperly-stressed words to try to determine the difference in the manner the participants deal with them. This method, however, could contain other parameters than stress in that process. In details, an improperly-stressed word possibly presents some changes in the quality of the vowel. It would affect the recognition of words, which would cause this type of task inadequate to separate the question of whether stress is included in the word recognition process. Although Cutler and Clifton did not try to study this issue, Slowiaczek (1990) brings it into consideration by providing words that contained at least two syllables with full vowels. This way, the only difference between the correctly- and incorrectly-stressed words is quality of the vowel. It is worth stating that, both the Slowiaczek (1990) and the Cutler and Clifton s’ studies claim that

incorrect word stress affects word recognition. Later, Slowiaczek et al. (2006) attempted to specify whether a lexical decision task (deciding whether what is uttered is a word or a non-word) or shadowing tasks are affected by a certain priming effect in favors of stress. For instance, the participants are requested to define whether *lifekime (*/ˈlaɪfkaɪm/) is a non-word after hearing a word with a similar stress pattern. This question is quite reasonable since some studies dealing with word recognition and semantic concluded that preparing had an effect on the organization of speakers‟ lexicon (Cooper, Cutler, & Wales, 2002). Consequently, Slowiaczek et al. (2006) planned a study to verify whether stress priming has an impact on the participants' responses, which would propose that likewise stress patterns are slightly linked in the speakers' lexicon. They came to the conclusion that the priming model does not have any impact on word recognition, but it still does on word stress.

One of the major disadvantages of the shadowing experiment or the lexical decision experiment is that it explores the problem of word recognition only in separated words lists. It might in result omit other features that are contained in word recognition. Sanders, Neville, and Woldorff (2002) assert that native speakers of English do depend on stress patterns to recognize detailed targets, and even they rely more so when semantic and lexical cues are not present. They directed a test to study whether stress has an effect on how speakers practice and how segment speech is the word spotting task. The initial stage in the word recognizing task consists of forming nonsense sentences; by doing so, various variations such as semantic, syntactic, or acoustic characteristics can be influenced while also letting different stress patterns. Once the nonsense sentences have been made, a target sound in isolation will be exposed to the applicants, and then they will be enquired to say whether they could recognize that target sound in the nonsense sentence and to identify in which syllable of the word they heard that particular sound.

Up to now, the study seems to indicate that native speakers depend on word stress to identify words or particular sound targets, but all the tests in these studies involve circumstances that stress information is practiced in a non-naturalistic situation.

Benrabah's study (1997) offers valuable information on this concern. He asked non-native speakers (NNS) of English to talk freely on a particular topic. Their address was audio recorded. Sentences were then set apart and given to of English

native speakers, who were requested to note down what they comprehended. The outcomes demonstrate that in some instances, the native speakers' comprehension was significantly influenced by placement of stress (e.g. the proposed word was "suitable", the non-native speaker falsely put the stress on the second syllable and the native speaker heard "the level."). However once again the problem of other features like quality of vowel may have an effect, this result significantly supports the statement that to some extent, native speakers rely at least on word stress while listening to speech. The next section studies the literature on how second language learners treat word stress.

- **Word Stress in L2**

In the previous section, it was revealed that native English speakers do rely on word stress in lexical processing. However, this does not signify that English learners use word stress as an element for identifying the words. Given the fact that word stress is not used similarly in all languages, and supposing that there is a significant level of L1 impact while learning the L2, this establishes a difficult area of analysis in the field of second language Acquisition. Particularly, it is Essential to know whether L2 speakers can use or learn about using L2 word stress information which is not considerably distinctive in their L1. As far as cross-linguistic transfer is concerned, three situations could be taken into consideration:

- No transfer; learners cannot imply the same stress pattern from their L1 while learning an L2.
- Full transfer; learners fully apply their word stress processing capabilities from their L1 to the L2.
- Partial transfer; only some elements from the L1 about word stress processing can be implemented in the L2 (Unsworth, 2004).

It is more interesting when the non-native learners have a very different behavior towards word stress (as in French, for example, where always the last syllable gets the stress and stress is not a distinctive element in word recognition). Besides, as Benrabah's study suggests, this research not only carries on word recognition; but it also speaks about the effects of understanding communication on the sentence level.

The first question is to ascertain whether there is a shift of stress patterns between the L1 and the L2.Cooper, Cutler, & Wales (2002) worked on a study to determine whether native speakers of Dutch, which is a language that shows irregular word stress in a way that it does not always get on the same syllable, as in English, are sensitive to word stress when listening to English. Advanced English learners were examined in a “cross-modal priming task” and a “word identification task”. In the cross-modal priming task, they heard sentences in which the first or second syllable of the last word was cut; they then were shown a phonetically identical or non-identical word that they had to recognize as an English word or non-word. In the word identification task, they listened to the first syllable of a word and found out if it phonetically equaled to a word that was shown. A controlled group of English native speakers also completed the same tasks. Surprisingly, the native speakers of Dutch language made it even better than the English native speakers (quicker and more accurate). It may be described by the fact that stress is a relatively more important limitation in Dutch as there is no vowel decrease in words. According to the stated tests and tasks, it can propose three probabilities; (a) there is transfer from the L1 to the L2 on the topic of stress pattern; or (b) since the contributors were advanced English learners, their awareness skills regarding stress developed and improved during their English acquisition, though this argument is less possible than (a), or (c) a combination of both (a) and (b).

Possibly an even more essential question which can arise is how the speakers of an L1 where word stress is not a significant element learn a language like English that word stress varies significantly. Dupoux, Navarrete, & Peperkamp (2008) discuss “stress deafness” of native French speakers. In their study, French applicants contributed in a sequence recall assignment in Spanish (like English, word stress in Spanish differs, and it is an element that is used to contrast meaning on the word level.) The applicants pushed two keys to hear a minimally contrasting word relating to each key. They could listen to the pronunciation of the words several times. The two words were diverse either only on the level of the phoneme (a minimal pair containing two different phonemes) or only on the stress level. Once the participants were ready, they heard one of the two words and were asked to determine which one they had heard. The results indicated that the native French speakers made far more mistakes (over 70%) when the distinction was made on the level of stress. The

outcomes were compared to those of two control groups: 20 native speakers of Spanish language and 20 native speakers of French language. It could be predicted that French learners of Spanish simply may make more mistakes than native Spanish speakers as they are still learning the language. The fact that the French control group and all the participants, despite their proficiency level in Spanish, show the same mistakes percentage leads to this conclusion that native speakers of French have difficulty differentiating word stress in the Spanish language. According to this test, Dupoux, Navarrete, & Peperkamp (2008) came to a conclusion that "Stress deafness emerges here as a robust processing limitation, which cannot be eliminated with significant exposure to a language with contrastive stress." To ensure that the results were not restricted because of the short-term involvement of the sequence memory recall task, they then executed a lexical decision task (determining whether some words which are different in stress placement were Spanish words or non-words). The results, here again, prove that the stress deafness is not only restricted to the short-term memory process but also expands to lexical access. Dupoux, Navarrete, & Peperkamp (2008) have a very sturdy opinion on this issue. It must be mentioned that however, participants had different levels of Spanish, there is no proof whether some of them had obtained formal training on this issue. There is neither any evidence that other factors come into play in recognition of stress in another language. Similar research works with native speakers of other languages such as English or Dutch would shed more light on this problem.

An area that might affect stress processing and that is not often considered within the field of second language acquisition (SLA) is music training. Kolinsky et al. (2009) designed a study to determine whether musical training might have an effect on word stress processing. They chose two groups of French monolinguals: the first group did not have any musical training; the second group was selected from musicians. The two groups had to make a sequence repetition task on non-words. The results showed that while the non-musician French native speakers can be categorized again as stress deaf, but the musician group did better in test and made fewer mistakes.

Tremblay's (2008) study does not hold up Dupoux, Navarrete, & Peperkamp's (2008) assertions. French Canadian learners of English participated in two tasks: a "crossmodal word recognition task" and a "vocabulary production task." This

research contains three proficiency groups to find out whether the English level of the French speakers would have an effect on their skill to use word stress identifying English words.

Tremblay states that “several L2 learners can use primary stress for recognizing English words, but only the L2 learners with a target like knowledge of stress placement can do so.” (Tremblay, 2008, p. 553) In other words, the exposure degree to the language is a variable that cannot be ignored while examining stress perception.

Tremblay’s study indicates that even learners whose L1 does not use word stress as an element for recognizing words are not deaf to word stress. It suggests that instruction about word stress or stress, in general, may impact perception in word stress.

2.12.4. The Importance of Learning Stress for Second Language Learners of English

Dupoux, Navarrete, & Peperkamp (2008) state that instruction given for word stress does not help learners with stress awareness. Only one group in their study explained above had a metalinguistic awareness of stress, as they had been taught clearly about contrastive stress as part of their Spanish language training and there was no difference in performance. It is not clear whether the learners had been instructed with stress rules which are simply applicable and not very difficult to remember. Nor is anything mentioned about the amount of time spent to build students’ metalinguistic consciousness about word stress.

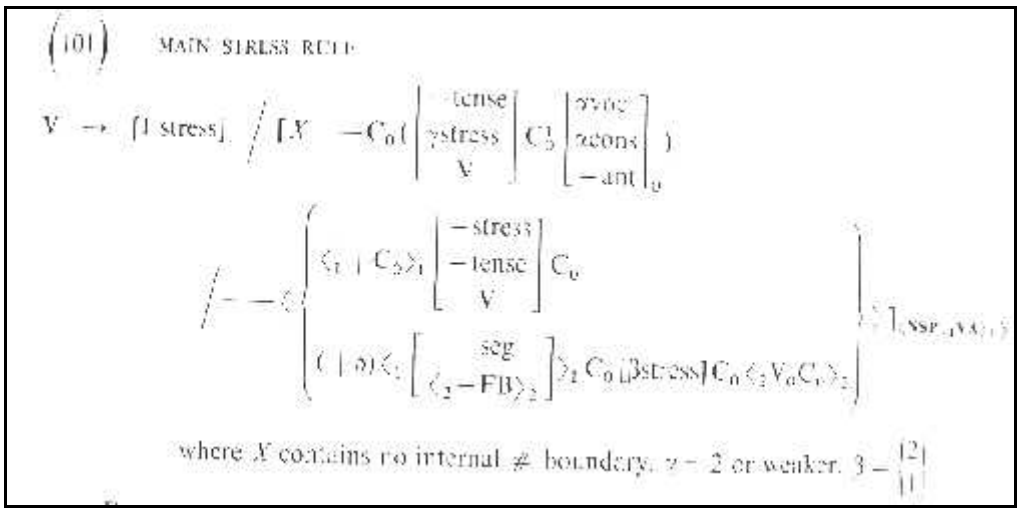
Murphy (2004), then again, has a different approach. He says that focusing on word stress helps the learners in learning vocabulary. After presenting a numeric system to classify stress patterns in English to two ESL classes, he questioned his students to get feedback about his tutorial methods. The numeric system that he designed only provided information to the student for considering the number of syllables in a word to guess which syllable of the word would get the stress. However this system is minimal and does not merely specify rules of thumb, but it still recommends that students can take advantage of it, since 25% clearly accepted that “applying the numeric system assisted them in learning new words pronunciation”, and “to learn about using new words in conversation” (36%).

In Tremblay (2008), it is also advised that more advanced learners can use word stress to identify words. Although the linking is not instant, this does suggest that there is a connection between instruction and word stress processing. Tremblay says that "knowing where the primary stress is placed in English words is not enough for L2 learners to be capable of using stress for L2 lexical access" (p. 353). With respect to Anderson s Active Control of Thought (ACT), before automatizing the process, first, there must be a perceptive stage and an associative stage, both of which may be facilitated through a metalinguistic understanding of stress.

2.12.5. Stress Rules in English

Stress norms and patterns in English are not as easy as in some other languages because it may not always be the same syllable of any particular word which receives the stress. Two different basic approaches have arisen in the field of research to deal with rules of stress in the English Language: Chomsky and Halle (1968), who suggest complicated phonologically-based rules, and Garde (1968), who provides stress rules with consideration of affixation. Garde's work was included by, among others, Guierre (1979, 1984, 1985), Fudge (1984), and Fournier (2007). Chomsky and Halle (1968) sketch out phonological rules that rely primarily on syllable weight and the concept of short versus long vowels. Chomsky and Halle's (1968) important stress rule is summed up in the following formula that is shown in Figure 2.3 (Chomsky and Halle, 1968, p. 109):

Figure 2.3: Chomsky and Halle s' Key Stress Rule



(Chomsky and Halle, 1968)

Though this phonological rule may provide valuable information about the comprehension of stress rules in English phonologically, its complication makes it challenging to memorize and even more difficult for second language learners to understand and use them while speaking.

Not only does this theoretical solution of word stress in English seem too complicated for English learners to adapt, but other researchers have also mentioned considerable imperfections with what Chomsky and Halle presented. Burzio (1994) wrote that:

One of Chomsky and Halle's (1968) claims is the assumption that long vowels in final syllables in the English language are always stressed, which was presented in SPE. That assumption implies for instance that words like *alumn*[*ay*], *sat*[*ay*]*re* must have a secondary stress on the bracketed long vowels (phonetic diphthongs). There is clearly no direct empirical evidence for that conclusion since if the latter vowels were simply long but unstressed, they would be pronounced just as they are (p.3).

Later refinements (Burzio, 1994) of Chomsky and Halle's (1968) rule are equally burdensome for language teaching purposes. It seems that the scholars opposing with Chomsky and Halle's claims have supported a morphological approach. In an analysis of Fudge's 1984 English Word-Stress, Guierre (1985) stated: "Section 4 deals with suffixes and, here, Fudge departs completely from Chomsky and Halle to join Kingdon, Garde and Guierre in classifying suffixes according to their 'accentual properties‟ (p. 519). Fournier (2007) also raises opinions to disprove Chomsky and Halle's outline. Fournier rejects Chomsky and Halle's claim that English stress rules derived from phonological rules of Latin are very much related to syllable weight, arguing that it is particularly unlikely that a language which was spoken by a minority and in very specific frameworks could cause vast phonological modifications to the phonology of English. Instead of following Guierre (1979, 1984), Fournier presents an analysis based mostly on morphology. In this context, words follow the Normal Stress Rule (NSR) if they do not have affixes attached to them. The NSR predicts the location and assignment of stress based on the number of syllables in the word:

- Words of two syllables are stressed /10/
- Three syllables Words are stressed /100/

- More than three syllables words are stressed /–100/

When the word has affixes, however, inseparable prefixes are generally not stressed (Germanic Law, in Fournier, 2007). Inseparable prefixes are those prefixes that cannot be parted from the stem without the stem losing its meaning. To the extent that suffixation is regarded, there are usually two types that are identified:

- Neutral suffixes: these do not influence the placement of the stress (e.g. *–ly*, *-ness*)
- Non-neutral suffixes: these do have an impact on the location of the stress.

This can be further categorized into the following two sub-categories:

- Non-neutral non-stressed suffixes: these suffixes have an impact on the place of stress and shift the stress to other syllables of the word than the suffix. (e.g. *–tion*, *-ity*, *-ate*)
- Non-neutral stressed suffixes: these suffixes draw the stress on themselves. (e.g. *–aire*, *-ee*, *-ese*)

It is this approach that is included in the present creative project. It is suggested that English learner could understand such a framework without sophisticated knowledge of phonology theory, and provide them with a simplification for predicting and generating the stress patterns of new words and assist in their reliable creation of stress in general. In brief, the location of word stress in English is not quite predictable with straightforward and brief rules. The historic nature of the English language (a mixture of Germanic origins and Romance elements, both of which have different stress instructions) has led to a combination that might seem confusing in its results. Although both schools of thought may provide benefits on the theoretical level, it is strongly believed that the morphological tactic is more adjustable for teaching materials for ESL students.

2.12.6. Review of Teaching Materials on Word Stress

In this section, an overview of some pronunciation textbooks is provided. The textbooks studied here were chosen because they deal with word stress and because of their availability. However, this does not suggest all the new materials that have been published; it signifies a good model of the common materials that are presented to English trainers. Textbooks that are issued before 1980 have been excluded from this

review. It establishes an amount of about 15 pronunciation manuals for which the most of them were released in the 90s (nine) and four in the 2000s.

All these textbooks mainly discuss the issue of teaching pronunciation. Therefore, word stress is not the main concern of these textbooks. Though, they all have at least one chapter discussing the stress on the word level and one chapter dealing with stress on the sentence level. Henrichsen et al. (1999) tackle word stress by incorporating pairs of words that vary mostly on the base of their stress patterns into a short story (usually half a page of written text). Then questions follow which emphasize the variance in meaning between the two words (e.g. comedy/committee). Even though this manual increases students' consciousness on stress, it does not offer them the instructions to guess and understand the logic in word stress.

Other pronunciation textbooks also emphasize the significance of word stress by presenting that differently stressed words could show a dissimilarity in meaning (the pairs INvalid/inVAlid, DEsert/desSERT seem to be well-known examples), but without including the pairs into a communicative situation. Usual activities include tapping the rhythm of words with one's hands, and a visual demonstration of the various stress patterns with different fonts and size patterns. There are three textbooks of pronunciation (Hagen, 1992; Dale & Poms, 1994, 2005, Kozyrev, 2005) that take the analysis somewhat further. They make an effort to increase students' consciousness in describing what stress is, providing a list of words that get their stress on the first or second syllable, and giving a list of homographs which offer various stress patterns whether they are nouns or verbs. The other works take the dealing with word stress slightly further by describing that word stress can be predicted on the base of certain affixes (Dauer, 1993; Gilbert, 1993, Grant, 2001; Hewings, 1998; Lane 2005; Miller, 2006; Orion 1997). It is worth mentioning that only a few books offer the learners with an in-depth list of affixes that affect stress (e.g. Grant (2001) lists 18 affixes; Miller (2006) lists 22 affixes; Dauer (1993) lists 38 affixes). Several manuscripts merely list between 5 and 10 affixes (Lane, 2005; Gilbert, 1993; Beisbier, 1994, 1995; Hewings, 1998). Most of the texts that show the connection between affixes and word stress demonstrate it by providing a list of words for each suffix or prefix and comprise a few spoken tasks to use some of these words. The main disadvantage of all the exercises that explain stress rules with respect to affixes is that they perform it only by itemizing words followed by the

particular stress pattern; they do not quite present words in a more accurate context. In addition, perhaps because of space limitations, these texts try hard to obtain a balance between the amount of information and the diversity of exercises that would make the students capable of being intelligently active in finding the stress patterns and that would enable students' attainment of the word stress patterns. For instance, Dauer (1993) lists 38 affixes, but he does it by presenting a table of the affixes and only a few examples for each affix.

2.13. The Status of Intonation in English

Intonation has been given much emphasis in recent years, and it has turned into a central factor of communicative competence stemming from its elemental role in top-down linguistic processing (Celce-Murcia, 2007). Among many other functions, it plays a part in the construction of discourse by indicating discourse segment limits, turn-taking, topic management, and marking information structure by highlighting new information (Celce-Murcia, Dörnyei, & Thurrell, 1995). However, some researchers assert that intonation is challenging or even impossible to teach (Jenkins 2000), while others have offered practical evidence for the efficiency of visualization techniques in intonation teaching and improving phonological and metalinguistic awareness (Hardison 2004; Gorjian, Hayati & Pourkhoni 2013; Levis & Pickering 2004; Tanner & Landon 2009; Chun 1998; Kaltenboeck 2001; Nagy 2014).

The sufficient progress of communicative ability has come to be a highly argued and complicated issue because of the use of English in the international situation by speakers of different backgrounds (Celce-Murcia 2007). The influence of the listener's native language is a fundamental factor to be pointed out in non-native listening. According to Major's (2001) model, Lecumberri et al. (2010) assert that the impact of L1 is "inversely proportional to the level of phonological competence", in other words, the sound system of L1 has more effect in the early phases of language acquisition, whereas in further stages, universal and target language features become more noticeable (Lecumberri, Cooke & Cutler 2010, p.881). Moreover, latest research recommends that L1 phonetic classifications, or the so-called L1-category filter, in themselves do not contain a description for non-native speech perception and processing. For example, non-native listeners were measured to make a better performance than native English speakers in sound distinction involving a sound

which was not part of their native inventory. Besides the effect of L1 categories, more general phonological standards and acoustic-phonetic elements, such as phonological features, appear to contribute to non-native speech perception and processing (Pajak & Levy, 2014, p.148-9).

2.13.1. Non-Native Suprasegmentals

There is a fast growing literature on the suprasegmental aspects of non-native English producing a high quantity of practical proof for the significance of suprasegmental features and the characteristics of non-native English (Chun 2002; Trouvain J. & Gut 2007; Munro & Derwing 1999; Baker 2010; Kang, Rubin & Pickering 2010). However, most of the studies have been narrowed on word or sentence level phenomena, such as word stress or intonational patterns or contours (Cutler et al. 2007; Lai 2008). Beside similar description, Cutler et al. (2007) compared English and Dutch native speakers' understanding of English and Dutch lexical stress minimal pairs. He discovered that non-native Dutch listeners could use suprasegmental material more efficiently in their mother tongue, which was partly assigned to the greater importance of suprasegmental material in lexical identification in Dutch. In other words, Dutch speakers were not dependent on English suprasegmental information, although segmental cues are considered more important in lexical access in English compared to Dutch. However, in another task, they performed better than native English speakers by shifting their native language suprasegmental processing abilities (Cooper, Cutler & Wales 2002, p.222–3). Lai (2008) tested the stress patterns of Mandarin learners of EFL and native speakers in noun-verb minimal pairs and concluded that Mandarin speakers used each correlate that was examined, duration, intensity, maximum f0 and mean f0 to differentiate nouns and verbs. Native speakers used mean and maximum f0, intensity and duration to determine stress for nouns, but only duration for verbs. Mandarin speakers, on the other hand, applied the four correlates every time for both nouns and verbs. The analysis of the second format revealed that native speakers decrease unstressed vowels in nouns and verbs, while Mandarin speakers only shrink unstressed vowels when they were located in the second syllable (Lai 2008, p.45-6). Wennerstrom (1994) examined several features of non-native intonation. The data was elicited in an oral reading task and a structured free speech task. The analysis focused on high phrase accents, high pitch accents, low pitch accents and high boundary tones. The

analysis found that among native speakers', intonational units are similar to grammatical units in their significance and predictability (Wennerstrom 1994, p.415). Additionally, non-native speakers were found to apply intonational patterns in a different way as compared to native speakers. In an investigation of non-native focus acquisition, Baker (2010) recognized numerous differences in non-native speech such as higher f0 maxima, larger f0 ranges, and stronger pitch accent nods (Baker 2010, p.212).

Though, there has been somewhat little research on non-native suprasegmental qualities above sentence level, or non-native instinctive speech (Pickering 2004; Hirschberg et al. 2007; Trouvain J. & Gut 2007; Chun 2002; Nagy; Nagy 2015). It is somewhat because of the difficulties and complexities of suprasegmental elements. Firstly, the challenges related to perception quantity of intonation stems from different factors like the existence of several cues and cue trading and the fact that intonational cues may provide diverse functions in diverse languages. Further concerns develop from the fact that f0 perception is also interrelated to higher-level linguistic processing. Furthermore, the combination of isolated and continuous features of intonation makes the measurement of f0 perception an ambitious effort (Vaissière 2008, p.239– 41). Additionally, non-native suprasegmental characteristic needs to be examined thoroughly, with attention to phonetic and phonological factors. Some non-native errors have been misunderstood because of the difference in the intonational forms or the use of acoustic cues (Mennen, 2004). Vaissière (2008) provides an overview of the issues associated with the study of intonation including the effect of phonetic context, discourse context, language specific and non-language specific processes. Among others, f0 features are not independent of the intrinsic f0, loudness, duration of the segment, the quality of surrounding sounds, the discourse intention of the speaker, pragmatic meanings, or the language specific use and perception of suprasegmental features (Vaissière 2008, p.242). However, non-language specific or universal aspects have also been suggested. Gussenhoven (2004) recommends the three biological codes, the Frequency Code, The Effort Code and The Production Code presenting a justification for the universal characteristic underlying the analysis of pitch variation. These comprise practical and informational understandings, but in each case signify universal form-function relations (Gussenhoven, 2004, p.79). Prominence is the informational elucidation of the Effort Code, that is

grammaticalized for being more accurate. The Effort Code is about the increased articulatory attempt in relation to particular meanings, leading to increased accuracy of articulatory and better pitch excursion. However, increased pitch does not essentially produce an effect of prominence. Prominence is comprehended on the basis of deviation from a reference line, such as the speaker's pitch register (Gussenhoven, 2004, p.85). In other words, the Effort Code is concerned with the speaker's demand to express meaning that is considered important. This meaning of importance is grammaticalized as the focus. The most popular type of focus is presentational focus or information focus, which is typically not differentiated from remedial focus in English, which uses up pitch accents to specify focus constituents. Besides intonation, languages may use other linguistic strategies to denote information structure, such as syntactic structure or focus elements (Gussenhoven 2004, p. 86–7).

2.13.2. Information Structure, Focus and Sentence Structure in Intonation

One of the main elements of intonation is its function marking information structure. Prosodic prominence indicates focused elements and new information, generally denoted with the term nuclear pitch accent (Ward & Birner, 2001, p.120). According to Chafe (2001), information structure is directed in interactions by the management of focus and periphery. The former is indicated with "distinctive terminal intonation contour, an initial resetting of the pitch baseline, the presence of silence before and after, a change of tempo at the beginning or end, and boundary changes in voice quality such as whispering or creaky voice" (Chafe 2001, p.675). Besides, Hirschberg et al. (2007) provide practical evidence for the use of down stepped contours for topic and information structure marking in reading and spontaneous Standard American English (SAE). They came to the conclusion that down stepped pitch accents are related with provided or inferable information. However, the issue that they also turn up with new information remains unanswered (Hirschberg et al. 2007, p.22).

The agreement view seems to be that information status should not be theorized as a contradiction of new vs. old information. Prince (1992, p.309) described information status along two extents, namely the Hearer and the Discourse. New information in this regard could be recognized by one or more participants of the interaction, and thus be Hearer-old, yet it can be Discourse-new if it had not been

formerly stated throughout the interaction. Moreover, some information may belong to the Inferable category, that means it is accessible (Prince, 1992, p.309). Furthermore, some researchers suggested extra sub-mechanism of signaling information status, such as salience and focus of attention. They promoted that givenness should be regarded as a sequence which includes the two limits of new and old status and the intermediary textual, situational and inferential accessibility (Venditti & Hirschberg 2003; Baumann & Grice 2006).

The role of intonation in syntactic disambiguation has also been widely inspected among native speakers. Warren et al. (2000) tested duration differences in the disambiguation of syntactically ambiguous sentences produced in a cooperative game task. The speakers and listeners were selected from inexperienced native speakers. Their results proved that prosody was used in the disambiguation process even when speakers had access to situational information assisting disambiguation. The authors discussed that prosody fulfills an important role in sentence comprehension (Warren et al. 2000, p.24). Schafer et al. (2000) observed the prosodic characteristics of data gathered with the same cooperative game task offered in Warren et al. (2000). Their results uphold the previous results that prosodic disambiguation is possibly played a part to sentence comprehension in different discourse situations. However, their results showed that prosodic formation could not be predicted only based on syntactic structure (Schafer, Speer, Warren, & White, 2000, p.180). Van de Vijver et al. (2006) tested f0 and length of focused lexical items in an experimental situation in various focus situation, named prosodic focus marking (question-answer pairs), syntactic focus marking (clefts/declarative sentences) and lexical focus marking (*only* as a focus marker). The outcomes proved that only nuclear accent had an effect on the duration and pitch of focused lexical items, and not syntactic or lexical focus marking (Van de Vijver, Sennema & Zimmer–Stahl 2006).

With regard to language learners, there is indication pointing to the different level of efficiency in the L2 use of prosody for syntactic disambiguation and the dominance of contextual signals on prosodic ones (Ying, 1996, p.698). Sennema et al. (2005) observed that the place of the word in the sentence was the strongest signal in lexical recognition and recall among German learners of L2. Prosodic focus marking was discovered to play only as a supportive role in word recognition at the beginning

or end position of the sentence. Nevertheless, prosodic focus marking has a more robust effect on words taking place in the middle position (Sennema, Vijver & Carroll 2005).

Finally, demonstration of fresh information may be interrelated to particular structures, such as existential *there* sentences, which are non-canonical structures with a proposed relevant subject and the expletive *there* occupying the canonical subject position. With regard to information structure, existential *there* sentences(e.g. "*There* is a river that runs from Pittsburgh down into West Virginia") are used to express Hearer-new information Hearer-old NP-s result in incorrect sentences and are not permissible in the post-verbal position of existential *there* sentences (Ward & Birner, 2001, p.127). Moreover, information status is also associated with definiteness (expressed by the definite article, demonstrative articles, possessive adjectives, personal pronouns and proper nouns), as Hearer-old information is usually definite, while Hearer-new information is normally indefinite (Prince, 1992).

2.13.3. Recent Literature Reviews of Intonation (Linguistic Approaches)

There have been many theories about intonation, but there is not much practical help concerning applying for an automatic intonation generation program. Pike (1975), Halliday (1970) and Crystal (1969) offer research works that are profoundly biased towards theory. Witten (1977, 1982), Allen, et al, (1987). This section begins by reviewing the theory and ends by comparing and contrasting the different approaches, as a basis for implementation and experimentation.

2.13.3.1. Pike's Theory of Intonation

Though pitch rise and fall in natural speech seem random, according to Pike(1975), they are not. Pitch fluctuations become regular so that speakers of a specific language use the same fluctuations in similar behaviors. These standardized pitch movements signify the abstract concept of an intonation contour.

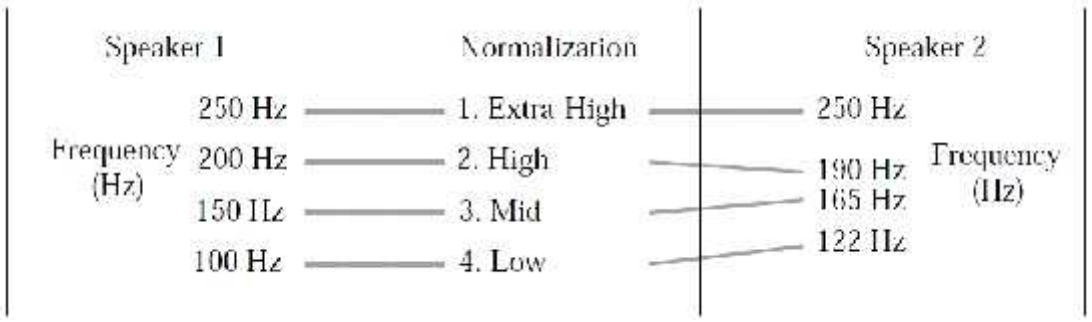
According to Pike's theory, the most significant unit of intonation is the level of pitch. A pitch level is a specific relative frequency of voice. Because the vocal chords of different speakers vibrate at distinctive levels, categorizing pitch levels in forms of frequency (Hertz) is not ideal. As an alternative, Pike (1975) has standardized all speakers in forms of four pitch levels. Intonation contours for all

speakers are illustrated by applying these levels. How these levels are drawn to specific frequencies depends on the speaker. Levels of the pitch are categorized as:

Extra high, high, mid and low and they are numbered from 1 to 4 respectively. Figure 2.4 explains the mapping between frequency and level of the pitch for two different utterers.

Any particular pitch level, in itself, is not significant. The significant pitch level is derived from the dynamic relationships among pitch levels. For instance, the fact that an utterer reached pitch level 2 (high) at some point in the utterance is not significant; though, that a speaker attained level 2 (high) followed instantly by level 4 (low) is significant.

Figure 2.4: The Four Pitch Levels for Two Different Speakers.



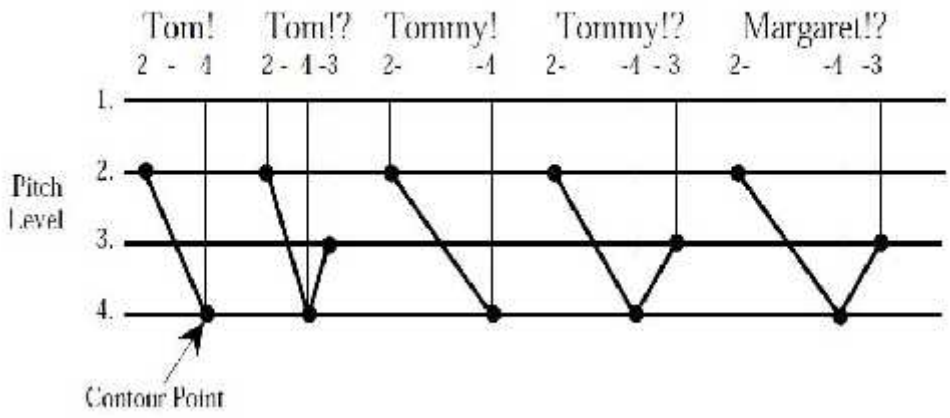
(Pike, 1975)

- **The Intonation Contour.**

With the basic definition of intonation unit, more complicated structures can be produced.

A contour can be defined as the sequences of pitch levels attained from an utterance. These points are called *contour points,* and the final contour is created by adding between them. Each contour has minimum one start and one end point, but there is no limit to the number of points within the contour. Figure 2.5 defines mapping pitch levels onto separated words and displays the resulting (interpolated) pitch contour.

Figure 2.5: Intonation Contours for Isolated Words.

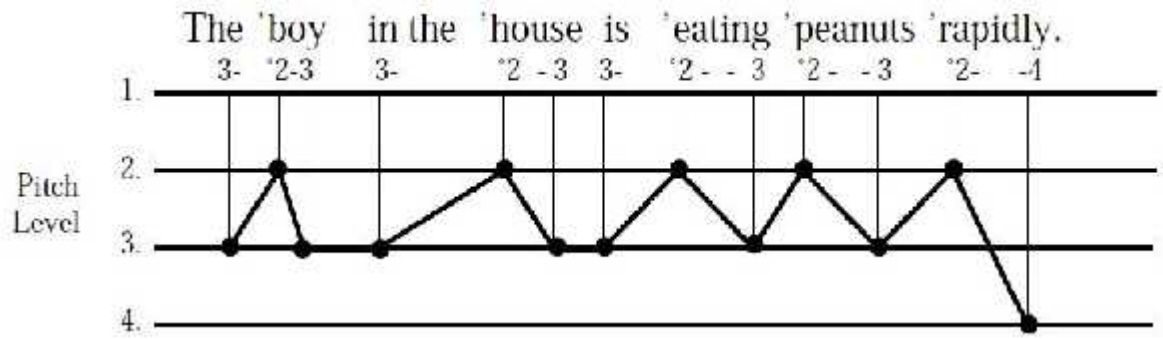


(Pike, 1975)

Describing contours for isolated words (such as those in Figure 2.5) is somewhat an easy task. The complexity rises when the number of words increases. In detail, defining importance within the utterance and corresponding contour points brings about the greatest difficulty. It is the same cause that Pike describes *primary contours*. These contours are those that are most likely to be perceived by a listener as prominent. However, s/he does not clearly define which contours are primary, but s/he does specify that main contours are likely to occur at the ends of utterances; hence, contours such as 2-4, 1-4, 2-4-3 and 3-2 are likely to be primary. All main contours must start on a lexically stressed syllable, and that syllable is marked with a "^{o}" (degree sign). For instance, the contours 2-4 may be written ^{o} 2-4 if they were primary.

Figure 2.6 displays a sentence with five stressed words (each marked with an apostrophe) and the resulting contour.

Figure 2.6: An Intonation Contour Defined Using Primary Contours



(Pike, 1975)

Often, immediately preceding a primary contour, there will be one or more unstressed syllables which are related to the main contour. These syllables are part of what is known as the *precontour*. A primary contour together with its precontour combine to create a *total contour*.

- **Rhythm and Intonation**

In Pike's (1975) scheme, it is recognized that rhythm and intonation interact. The unit of rhythm is the pause, and two types of pauses are described. They are final pause and the tentative pause. The tentative pause consists of two kinds. Speech may completely stop, or sounds may be stretched to be compatible with the length of the pause. The tentative pause happens when the speaker's attitude is one of uncertainty, and it influences intonation contour in two ways. Firstly, it will keep up the height of the final pitch of the contour or, in some cases it might produce a minor rise in height. Secondly, Pike asserts that a tentative pause may affect an intonation contour at an "unspecified" location. The "usual" position of this effect is the syllable or group of syllables right before the pause; however, the prominent syllable of the main contour may be extended. Pike does not specify whether or not neither groups of syllables can be influenced, nor does he specify what would happen if two or more primary contours are engaged.

A final pause happens while the speaker's attitude is one of finality and it will have a tendency to lower the previous contour. If a contour is falling, it will have a tendency to fall farther than would normally be expected; if a contour ends with a rise, the resulting rise will not have a tendency to be as great as expected.

The mechanism in which rhythm and intonation are joint is called a *rhythm unit*. A rhythm unit is a sequence of syllables that are not interjected by a pause. A rhythm unit with only one main contour is termed a simple rhythm unit, and it is Pike's claim that rhythm units are articulated in a simultaneous manner.

- **The Function of Intonation.**

The role of intonation in this scheme is relatively clear. The semantic content of an utterance depends on two kinds of meaning: *lexical meaning* and *intonation meaning*. Lexical meaning is the inbuilt meaning in words themselves; these meanings could be found in a dictionary. Intonation meaning, however, changes lexical meaning by forcing on the speaker's attitude. For example, the simple sentence, "Are you ready yet?" can have different meaning depending on the contour of intonation. The question may have a different meaning if it is uttered with a sarcastic tone than if it is uttered with a neutral tone. Pike has classified numerous primary contours regarding the direction of pitch change and pitch level. Contours within these categorizations have significant meaning consistency. This information is encapsulated in Table 2.1.

Table 2.1: Summary of Pike's Intonation Contours.

Classification	Contours	Intonation meaning
Falling to Level 4	ˋ1-4, ˋ2-4, ˋ3 4	Contrastive Pointing. The centre of the speaker's attention. Strong.
Falling to Level 3	ˋ1 3, ˋ2 3, ˋ2 3 2, ˋ1 3 2	Contrastive Pointing. The centre of the speaker's attention. Mild
Rising from Level 3	ˊ3-2, ˊ3-1	Incomplete. Needs supplementation. Polite. Cheerful.
Rising from Level 4	ˊ4-3, ˊ2-4-3, ˊ1 4 3, ˊ3 4 3, ˊ4-3-4, ˊ4-2, ˊ2 4 2, ˊ1 4 2 ˊ4 1, ˊ2 4 1, ˊ1 4 1	Incomplete, Deliberative. Often used when asserting an idea in an argument
Level 1 and Level2	ˊ1 2, ˊ2 1	Cheerfulness, Lightness, Politeness, Incomplete.
Level Contours	ˊ1 1, ˊ2 2, ˊ3-3, ˊ4-4	Contrastive pointing with Nonfinality. Unification of ideas.

(Pike, 1975)

2.13.3.2. Halliday's System of Intonation

The main objective of Halliday's system of intonation is to teach British English intonation patterns to non-native English speakers. Intonation contours are described through a basic structure called a tone group and are joined with speech over a rhythmic framework.

- **Rhythm**

Halliday (1970) starts his theory of intonation by describing a firm rhythmic framework for speech. The unit of rhythm is called the *foot,* and it consists of at least one significant syllable followed by zero or more unstressed syllables. Foot margins are specified by the "/" character, and the boundaries of tone groups (defined later) are shown by a double slash ("//"). The rhythmic demonstration of the sentence, "This is the house that Jack built," is, "// This is the / house that / Jack / built. //". However, a foot may contain any number of syllables, Halliday asserts that feet of different sizes have a tendency to be uttered in the same amount of time and, therefore, prominent syllables are pronounced at a stable rate (feet are simultaneous).

Foot boundaries do not essentially happen between words; if a prominent syllable is within a word, the foot boundary would also be within the word. For example, in the sentence, "that chair is very uncomfortable," the prominent syllable of the word "uncomfortable" is the second syllable. The resulting rhythmic demonstration of the sentence would, therefore, be, "// that / chair is /very un/comfortable. //" One of the problems in this kind of rhythmic framework is it assumes that each spoken sentence will start with a prominent syllable. According to Halliday, feet are similar to bars of music, and thus they must begin with a beat. Although, just like bars of music they can initiate with a rest, feet can start with a period of silence which he names it as *silent stress*.

- **Basic Intonational Structures**

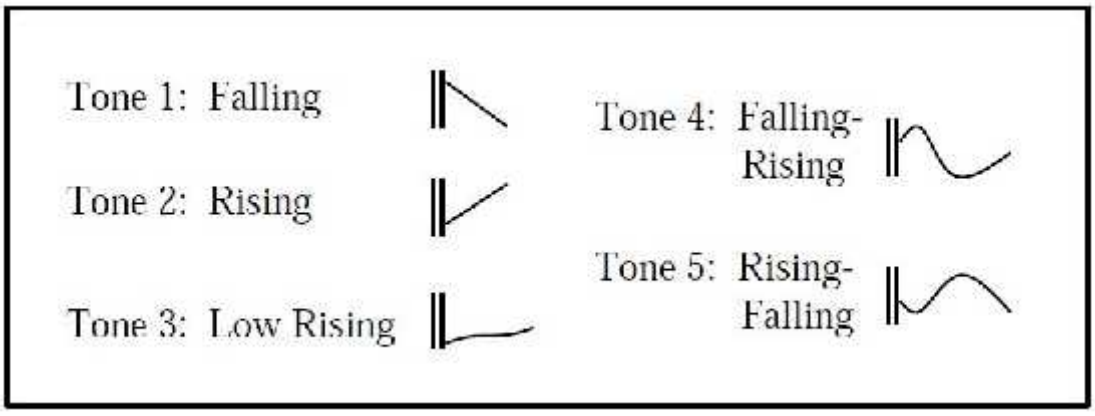
The basic unit of intonation is called the *tone group*. Similar to the foot which is a chain of syllables, a tone group is a sequence of feet. In a tone group, there will be one foot with an especially prominent noticeable syllable. This foot is named as the *tonic,* and it is indeed the data point of the tone group. Each tone group will contain one tonic which may go before an optional pre-tonic.

The pre-tonic part is similar to Pike's pre-contour in which it holds all of the feet before the tonic. The tonic division of the tone group lengthens from the tonic syllable to the end of the tone group. The tonic syllable must be prominent, and generally, it gets the leading pitch movement. In the orthography, the tonic is underlined. For instance, in the sentence, "This is the house that Jack built," the word "Jack" is the tonic, and therefore, most prominent.

- **Primary Tones**

Pitch contours are connected to tone groups through the use of *tone*. In this system, a significant number of pitch contours are classified into a small number of tones. Major tone classifications are distinguished by the movement of pitch over the tonic syllable. Differences in a category may show different pre-tonic movements or an altered tonic movement. As Halliday explains it, a tone is believed to be falling if the pitch is falling over the tonic segment. Figure 2.7 graphically demonstrates the pitch movement of tonic in association with each Halliday's primary tones; the double vertical bar indicates the beginning of the tonic syllable. Tone 1 is most associated tone with declarative utterances, and tone two is applied to questions. Tone three is concerned with what other intonation systems call a *continuation rise*; the continuation rise denotes some degree of doubt and non-finality. Tones four and five both have a change of direction throughout the tonic syllable. According to Halliday, the change in direction demonstrates a "change of mind". Hence, the tone 4, culminating with a rise, would be most closely related to reservation and tone five would be applied to claim a specific point.

Figure 2.7: Halliday's Primary Tones.



(Halliday, 1970)

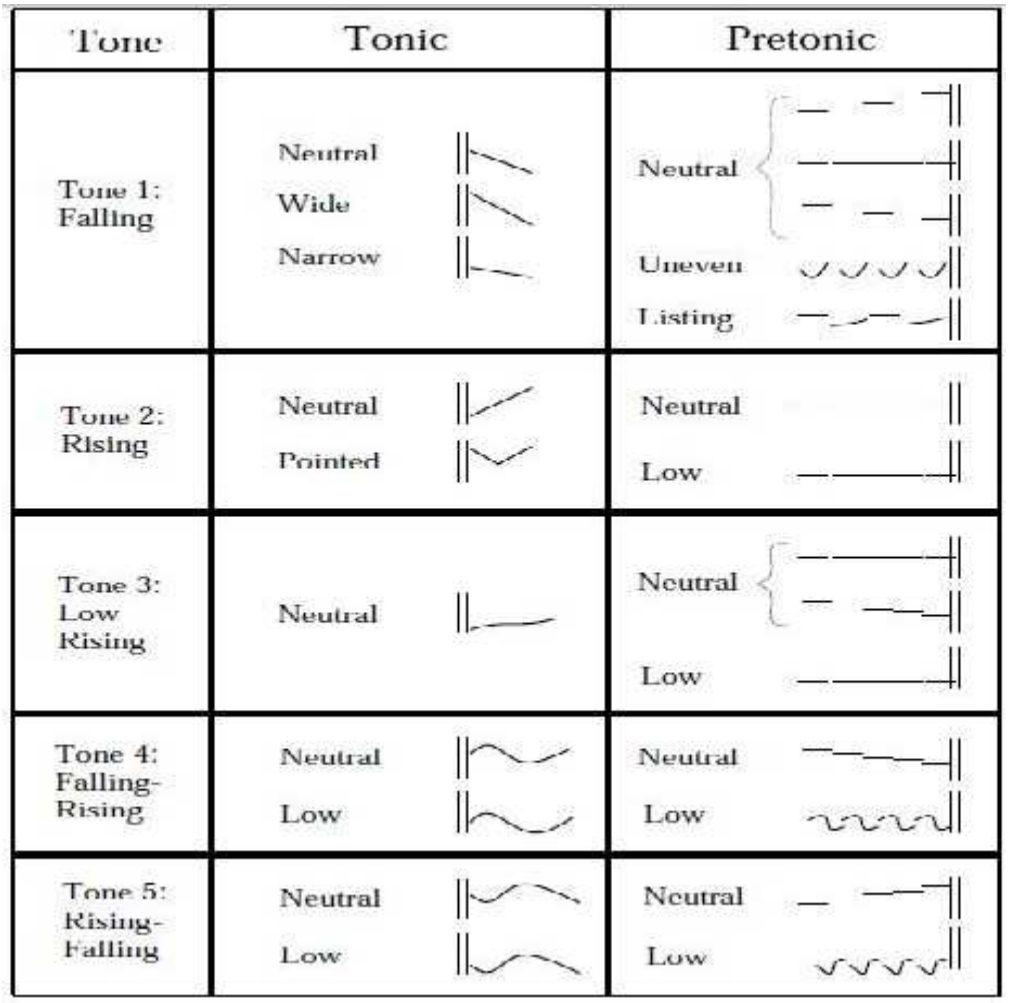
Despite the fact that tones in general function separately, two tone sequences seem to deliver a specific function. The tone sequences 13 and 53, according to Halliday, have become bonded to the fact where there can be no pre-tonic between

them. He names these two tone sequences *compound tones* and says that no other sequences are as firmly joined as these two.

- **Secondary tones**

Secondary tones occur in conjunction with primary tones. The final shape of the contour is defined via secondary tones. Secondary tones help in defining both the tonic and pre-tonic parts of the contour. For every primary tone, there is one secondary tone called “neutral”. The neutral contour is usually regarded to be a safe selection if there is no information provided to assist in the choosing of the secondary tone. Figure 2.8 displays all secondary tones for the defined primary tones.

Figure 2.8: Halliday’s Secondary Tones.



(Halliday, 1970)

2.13.3.3. Crystal's System of Intonation

Crystal's (1969) system of intonation provides a profound change in pattern from Pike and Halliday s' systems regarding contour description, but the resulting system yet persists similar. Crystal (1969) asserts that intonation is not an ordinary system of contours or levels of the pitch like those systems that explained by Pike and Halliday; he claims that intonation is a "system of prosodic systems" which work in various ways.

Crystal (1969) says at the beginning that systems of the past have endeavored to abbreviate the definition of intonation to the movement. It is desirable as the resulting formal explanation of intonation is straightforward. However, when the question is about the meaning of intonation, only pitch factor can be accounted for it, and other factors are not able to elaborate its meaning. To solve this issue, Crystal expands the definition of intonation, but the outcome is a more complicated system.

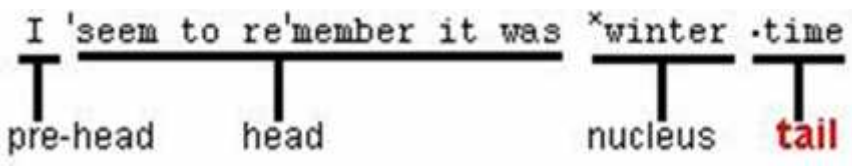
- **The Tone Unit**.

In the system of intonation, one unit is easily observable, frequent and practical. Crystal names it as the *tone unit*. Tone units are non-overlapping, and every unit has one point of prominence which is called the *nuclear pitch movement*. Two factors show a boundary point between two tone units. The first factor is a minor pause or alteration of the sections near the boundary which is similar to Pikes' "tentative pause". The second factor is a noticeable change in pitch which is mostly, opposite in direction to the nuclear movement of the pitch.

The tone unit is split into four parts that can be stated as the: pre-head, head, nucleus, and tail. Each part is optional with the exclusion of the nucleus. The head denotes all syllables from the first salient syllable up to (but not including) the nuclear tone.

The figure below demonstrates an example of tone units in a sentence.

Figure 2.9: Demonstration of Tone Units in a Sentence



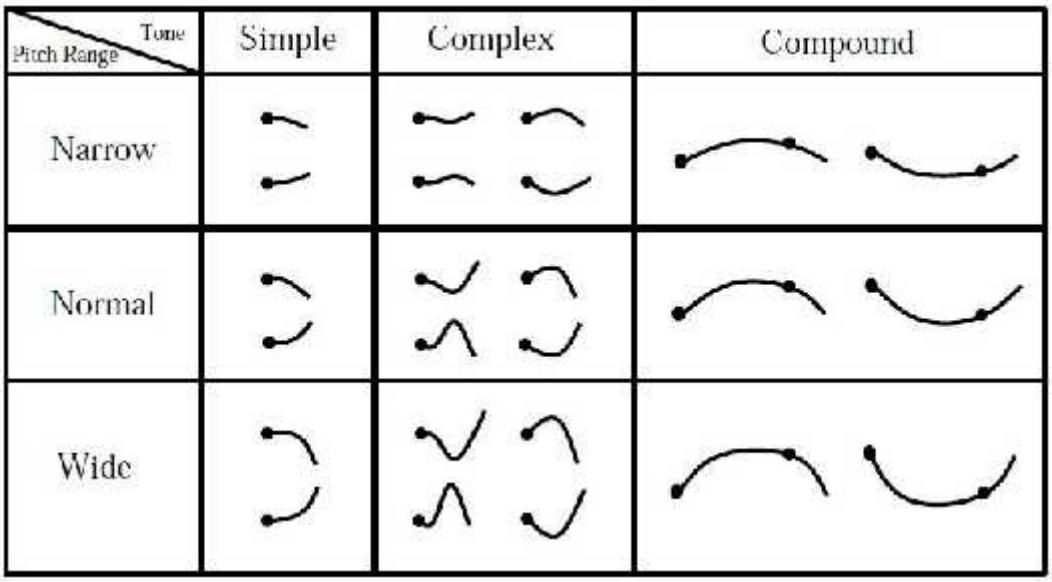
(Crystal, 1969)

As it is shown in Figure 2.9, The pre-head signifies all syllables which precede the head. The nucleus is the syllable which comprises the pitch movement of nuclear and the tail embraces all syllables post the nucleus to the end of the tone unit. It is essential to notice that this structure while being different in explanation, but it is practically similar to Halliday's system. The pre-head, if present and head represent pre-tonic, and the nucleus and tail are correspondents to the tonic. Crystal's (1969) system has a stronger potential for control but also has more issues regarding choosing specific contours.

The nuclear pitch movement retains the pitch and the tone range which are the two key factors. The tone can be either simple, compound or complex. Simple tones contain a non-directional movement of the pitch. The pitch can be in the form of either falling, rising or level. When there is a change in the direction of the pitch movement over the nuclear syllable, it is called complex tones.

The main classifications are fall-rise and rise-fall, but fall-rise-fall and rise-fall-rise are also included. Compound tones are also called as *binuclear tones* and are identical to Halliday's compound tones (although Halliday only described two compound tones). In this case, two tones are performing as a single tone unit. The subsequent pitch movement is "trough-like" in appearance which contains two nuclei. Pitch range is split into three kinds: wide, normal, and narrow. Figure 2.9 presents an outline of the various tones.

Figure 2.10: Summary of Crystal's Tones.



(Crystal, 1969)

- **Chaining Tone Units.**

By evaluating different previous writing works, Crystal has acquired frequency data for both the sequences particular tones and the basic tones. In Table 2.2, the frequency is demonstrated for the basic tones. Table 2.3 presents the percentage occurrences of two tones with the following condition: given the occurrence of tone 1, what is the possibility that tone two would be a component of the next tone unit. Percentage amounts in Table 2.3 do not add to 100 because the categories are not mutually exclusive.

Table 2.2: Percentage Occurrences for Basic Tone Units.

Tone Type	Probability
Falling	51.2
Rising	20.8
Falling Rising	8.5
Falling-Rising (Binuclear)	7.7
Rising-Falling	5.2
Level	4.9
Rising-Falling (Binuclear)	1.7

(Crystal, 1969)

Table 2.3: Tone Sequence Probabilities.

Tone 1 Type	Tone 2 Type	Probability (%)	Tone 1 Type	Tone 2 Type	Probability (%)
Rising	Rising	83.3	Rising	Level	55.1
Falling-Rising	Falling-Rising	79.5	Falling-Rising	Level	54.1
Level	Level	77.9	Rising-Falling	Falling	40.7
Rising	Falling-Rising	68.4	Rising-Falling	Falling-Rising	34.4
Rising-Falling	Rising-Falling	67.0	Level	Falling	27.7
Rising	Falling	66.0	Level	Rising	26.7
Falling-Rising	Falling	65.6	Rising-Falling	Rising	25.3
Falling-Rising	Rising	64.7	Level	Falling-Rising	17.8
Falling-Rising	Rising-Falling	63.9	Rising-Falling	Level	16.2
Rising	Rising-Falling	63.3	Level	Rising-Falling	5.7

(Crystal, 1969)

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Chapter - 3

A Brief History of CALL-based Approach in ELT

CHAPTER 3

A BRIEF HISTORY OF CALL-BASED APPROACH IN ELT

3.1. Introduction

During the previous two decades, the practice of spoken language skill has become the center of attention among educators. Foreign language programs emphasized on productive skills with special emphasis on communicative competence. Students' ability to involve in significant conversational communication in the target language is believed to be a principal aim of second language acquisition. This change of importance has produced a developing necessity for instructional materials that offer an opportunity for organized interactive speaking practice outside the classroom.

With modern improvements in multimedia equipment, computer-assisted language learning (CALL) has appeared as an enticing substitute to old-style approaches by supplementing or interchanging direct student-teacher interaction, such as the language laboratory or audio-tape-based self-study. The incorporation of sound, voice communication, text, video, and animation has made it possible to generate self-paced interactive learning surroundings that promise to enrich the classroom model of language learning considerably. An increasing number of textbook publishers now provide educational software of some sort, and educators can select among a wide range of different products. Yet, the practical influence of CALL in the arena of foreign language education has been rather uncertain. Many educationists are unwilling to comprise a technology that still awaits approval by the language coaching community as a whole (Kenning & Kenning, 1990).

Some causes have been mentioned for the limited practical impact of computer-based language instruction. Amid them, we can first mention that there is the absence of a unified theoretical outline for constructing and assessing CALL methods (Chapelle, 1997; Hubbard, 1988; Ng & Olivier, 1987). There is also the lack of final empirical evidence for the educational advantages of computers in the process of language learning (Chapelle, 1997; Dunkel, 1991; Salaberry, 1996). Finally, there is also the limitations of the CALL technology itself (Holland, 1995; Warschauer, 1996).

The quick technological improvement of the 1980s has increased the need and the prospects on the computers as the possible learning instrument. Teachers and second language acquisition (SLA) researchers alike are now insisting on smart and user-adaptive CALL method that provide sophisticated diagnostic tools and also possess accurate feedback processing that is capable of focusing the students on extents that need curative practice.

According to Warschauer, a computerized language instructor should be capable of understanding a user's verbal response and assess it for correctness and appropriateness. It should be able to detect a student's difficulties in pronunciation, syntax, or usage, and then logically decide among a range of options (e.g., repeating, paraphrasing, slowing down, correcting, or guiding the learner to background justifications). (Warschauer, 1996, p. 6) Salaberry (1996) expects nothing but a system capable of simulating the complicated socio-communicative competence of a live tutor; in other words, the linguistic brainpower of a human--only to determine that the effort to make an "intelligent language tutoring system is a fallacy" (p. 11). As the speech technology isn't perfect, it is not useful at all. If it "cannot account for the full complexity of human language, why even bother modeling more constrained aspects of language use" (Higgins, 1988, p. vii)? This kind of all-or-nothing reasoning seems symptomatic of much of the latest educational literature on CALL. The pursuit for a theoretical foundation of CALL system design and assessment, (Chapelle, 1997) have a tendency to direct to overstated expectations as to what the technology should achieve. When it is combined with little or no knowledge of the essential technology, the inevitable result is disappointing.

3.2. What is CALL?

Computer-Assisted Language Learning (CALL) is an interesting tool for language teachers and learners as it can deliver customized instruction and instant response on the accuracy of a learner's answer to computerized tasks (Nagata, 1993). In computer-aided pronunciation (CAP), technology has improved learners' access to their and others' pronunciation performance through graphical demonstrations such as spectrographic analyses of individual phonemes or amplitude waves showing levels of intensity for separated words or phrases (Anderson-Hsieh, 1992, 1994; Hardison, 2004; Molholt, 1988). While such programs can offer learners with an instant

response about the correctness of a statement paralleled to that of a native speaker (NS), they usually need teacher observation and clarification. Pennington (1999) names another disadvantage of CAP, asserting that almost all CAP programs focus exclusively on segmentals. This emphasis indicates that intelligibility is mainly impaired by the articulation of individual sounds and pays no attention to the impact of prosody. If intelligibility is ranked above accuracy, focus on keywords, stress, rhythm, and intonation instead of the articulation of particular sounds, may be required. Experimental research has begun to approve the importance of prosodic features in learners' total intelligibility and perceived comprehensibility. Blau (1990) concluded that proper pausing patterns in native English speech had a considerably greater impact on non-native listeners' comprehension than either syntactic difficulty or speech rate. Fayer and Krasinski (1995) realized that native speakers' intelligibility judgment of non-native English speech is notably linked with the length of the pause. Native speakers(NS) rated non-native speakers (NNSs) with longer individual pauses and greater total pause time as less intelligible than those with more proper pause interval. Towell, Hawkins, and Bazergui (1996) concluded that as British learners of French enhanced their pausing patterns in French, their overall fluency also improved, as assessed by speaking rate.

Regarding stress, Field (2005) figured out that when native English speech was manipulated to contain false lexical stress, both NS and NNS listeners skill to find out words in the connected speech was extremely influenced (p. 419). Sentence stress, also recognized as primary stress (Hahn, 2004), also has a vital role in effective communication. Hahn (2004) said that correct sentence-level stress by an ESL speaker, compared to undue or omitted stress, led the listener to improve comprehension and recall the content. On the subject of the importance of intonation, Levis (1999, 2002), Levis and Pickering (2004), and Jenkins (2004) have put emphasis on the significance of teaching intonation in context, preferably at a discourse-level, instead of teaching it within separated sentences. Wennerstrom (1998) examined short lectures set by Chinese ESL lecturers and conclude that those applying proper intonation contours acquired higher scores on a speaking skills test. Likewise, Pickering (2004) discovered that NS teachers steadily used discourse-level of intonational indications to "emphasize relationships between semantically related sections of the discourse and highlight information structure" (p. 38) while

international teaching assistants (ITAs) did not. She observed that the ITAs' weaknesses in discourse-level intonation were likely to slow down students' understanding. This research into the influence of pausing, stress, and intonation on the intelligibility of non-native English speech has encouraged teachers and materials developers to devise various techniques for incorporating suprasegmental exercise into the classroom. The earliest form of such technique, jazz chanting (Graham, 1978), still continues to be applied and supported by teachers who have students chant poems and songs to get more familiar with English rhythm, stress, and intonation (Richman, 2005). Other spoken methods are promoted in educational materials to improve learners' use of prosodic features. Mirroring, tracking, and shadowing includes duplicating discourse models of a native speaker (Celce-Murcia, Brinton, & Goodwin, 1996). A fourth imitative method, mimicking conversation (Goodwin, 2004), has ESL learners select, analyze, and then replicate a brief one- to a two-minute clip of a dialogue selected from a film or TV-show. While such techniques have been encouraged as ways to offer contextualized practice of classroom for suprasegmentals, experimental research about the specific benefits of such techniques has been slow in coming. As Celce-Murcia, et al (1996) says: "There is no consensus in the literature about which of these techniques is most effective; we advise teachers to experiment with them and get feedback from their students as the learners themselves are the ultimate judges of what they find most useful (p. 310)". Obviously, experimental research is needed to study the real influences of these pedagogical methods on learners so instructors can make sound decisions about their use. Empirical studies performed in recent years have centered on the impacts of different forms of pronunciation instruction on students' whole levels of intelligibility and comprehensibility. Intelligibility is "the extent to which a listener actually understands an utterance" (Derwing & Munro, 2005, p. 385) and is often assessed through transcription or listening comprehension tasks made by a listener. Comprehensibility is "a listener's perception of how difficult it is to understand an utterance" (Derwing & Munro, 2005, p. 385). Comprehensibility (also denoted as perceived comprehensibility) is often evaluated through a Likert scale to rate speech samples on the base of listeners' perceptions of how simply the speaker or speech stimuli can be understood.

Derwing, Munro, and Wiebe (1997) studied how a 12-week course aiming at prosodic features might influence ESL students considered to be fossilized in their English pronunciation skills. Learners were recorded at Time 1 and Time 2 reading sentences and telling a story based on picture prompts. Results collected from 57 NS listeners indicated noteworthy changes at Time 2 in the ESL speakers' intelligibility, comprehensibility, and accent. The researchers came to the conclusion that pronunciation instruction that is not emphasizing the importance of segmental units, joined with a greater focus on prosody and frequent speaking features, would efficiently change fixed pronunciation patterns in persons who have spent several years in an English-speaking surroundings.

Considering the 1997 study's positive finding, Derwing, Munro, and Wiebe (1998) directed a second study comparing the impact of various types of instruction on NNSs' comprehensibility, accent, and fluency. Forty-eight intermediate ESL students were engaged to one of three forms of instruction (segmental accuracy, universal features (e.g. rhythm, stress, intonation,) and no particular program of instruction) for 12 weeks. The results showed that in the sentence-reading tasks, the segmental and global treatment groups enriched from Time 1 to Time 2 in accentedness and comprehensibility. For the narrative task, only the treatment group developed considerably. The researchers found that "attention to both global and segmental concerns benefits ESL students. The global instruction, however, seems to provide the learner with skills that can be applied in extemporaneous speech production" (p. 407). Derwing and Rossiter (2003) again analyzed the data from the Derwing, et al. (1998) study in an attempt to determine how the progress in comprehensibility and fluency reported in the results for the narrative task were presented in students' oral productions before and after pronunciation instruction. They found that if the purpose of pronunciation teaching is to assist learners to become more intelligible, then instruction should contain a sturdier emphasis on prosody (p. 14). While teachers and students experiment with different methods to promote assessable improvements, one challenge encountering learners is the number of teachers missing formal preparation and training to teach pronunciation. Breitkreutz, Derwing, and Rossiter (2002) examined ESL teachers in Canada and discovered that 67% stated having no training in pronunciation instruction. Derwing and Munro (2005) refer to additional studies showing the shortage of trained

pronunciation instructors in other English-speaking countries such as Australia and Britain. This lack of experienced teachers leads to a lack of quality pronunciation instruction, proposing a must for materials that would allow learners to guide their own pronunciation learning outside the classroom. Studies by Hardison (2004) and Pennington and Ellis (2000) have proved that computer technology can support second language learners to learn prosodic patterns of the language if the computer tasks concentrate on learners' attention on how prosody works within a piece of discourse. As ESL learners come to be more aware of the function of these prosodic features, they can start to predict where the pauses should befall, which syllables and words should get stress on it and whether intonation should be rising or falling at the end of a statement. This process of observation and prediction, followed by production of prosodic elements, is advocated by researchers pushing the use of pronunciation tactics (Hahn & Hahn, 2007; Sardegna & Molle, 2008). Setting these tactics into computer-assisted tools would advantage to the learners by permitting them to control their own learning and by providing discourse-length frameworks in which to practice those prosodic features that improve intelligibility and comprehensibility.

3.3. Theoretical Background of CALL

The origins and development of CALL trace back to the 1980's (Hinks, 2003; 2005) since the early CALL has established into the symbiotic relationship between the development of pedagogy and technology. The idea of CALL puts a peculiar emphasis on student-centered lessons that would allow the learners to learn their own using planned and/or unplanned interactive lesson. These lessons convey two important features individualized learning and bidirectional learning. In linguistics, prosody is the rhythm, stress, and intonation of speech. Prosody generally speaks of the structure of spoken utterances, however, the term has been described in several ways in the literature.

The numerous definitions of prosody can be classed into three categories (Hubbard & Levy, 2007). One class describes prosody as the collection of its acoustic correlates such as amplitude and segment quality, the frequency of duration, or reduction. The second class is based on the role of prosody as the phonological

organization of segments into higher-level constituents, such as utterances, intonational phrases, prosodic words, metrical feet syllables, etc.

The third class of definition blends the phonetic and phonological features of prosody, including both the phonetic manifestation organization and the higher-level of this organization in the pattern of frequency, duration, etc., within the utterance. we believe that this class of definition is most appropriate for the investigation of prosodic theory. Prosody can reveal different aspects of the speaker's utterance. It is important to the analysis and interpretation of spoken utterances. For example, the pitch accents can be detected to locate the focus of an utterance and assist semantic/pragmatic interpretation, the general shape of the pitch contour of an utterance (e.g., rising, falling) can be analyzed to ascertain the mood of sentence, e.g., statement, question, etc (Healey, 2003).

Prosodic cues can also reveal the formation of a message and perform a vital role in distinguishing dialogue acts of speech (Aist, 1999). Even speaker’s mood can be identified by prosodic features of speech and find his/her emotional state.

Numerous studies have been done to discover the relationship between the personality and emotional state of the speaker in changing prosody. So we see that these features of the language are so important. In the area of teaching second/foreign language, this importance is more obvious, as learning and obtaining the prosody of the target language can affect the native speaker's judgment. Of all prosodic features of English, this study focuses on the stress and intonation that are important to interpret the meaning of an utterance.

3.3.1. Stress

A stressed syllable can be described as one which is more prominent than the surrounding ones and it usually stands out among them. This distinction is usually achieved through a considerable increase in loudness of sound on that syllable. A stressed syllable may also be slightly longer in duration than an unstressed syllable and be produced at a higher than normal pitch. Stress also determines, to some extent, the value of vowels in a word-whether an /a/, for instance, is to be pronounced as /e/, /ə/, or /æ/.

The position of stress in words of two or more syllables in English is not always predictable. In other words, it is particularly difficult to predict the stressed syllable in a two or polysyllabic word in English. Therefore, many times students have to turn to an English dictionary to learn which syllable of a word should be stressed. However, there are some of their difficulties in learning English stress. Some of these Patterns which enjoy high frequency are accounted for below. However before turning to stress patterns, it must be noted that there are four levels of stress in English; primary_ˈ, secondary_ˈ, tertiary_ˑ, and weak. That is, polysyllabic words normally have more than one stressed syllable, one of which is often more prominent than one stressed syllable, for example in "ˈeconomical, /ˌikəˈnɑmɪˑkəl/ the third syllable has primary stress, the first syllable has secondary, and the rest of the syllables are weak (Gorjian, Hayati, and Pourkhoni, 2013).

3.3.2. Intonation

Intonation is a mixture of musical tones on which we pronounce the syllables that produce our speech. It is closely related to sentence stress. Often, but not always, a syllable with sentence stress is spoken on a higher note than the unstressed syllable. In such cases, intonation is one of the elements of stress, the others being loudness and length. We can indicate the intonation in sentences by writing them on something like a musical stuff. Intonation is the rise and fall of our voice on certain words in a sentence. Tones of voice can be divided into four types: normal, high, extra-high, and low. We can then show the movements of voice up and down by drawing lines at four different levels over or under a sentence. A line drawn at the base of the letters of a word shows that the word is pronounced in a normal tone, a line above the word an extra high tone, but this tone is seldom used except when some emotional emphasis is required, such as fear or surprise (Gorjian, Hayati, and Pourkhoni, 2013).

3.4. Experimental Background

Depending on the program, the computer can contribute to the learning of many features of language and culture to the learners of different levels (Hayati, 2005). On the subject of the importance of having an intelligible pronunciation for language learners, researchers and teachers have begun to apply this technology to teach phonology of the target language to their students. There has been an effort for using

computer technology in order to teach oral skills and help students to manage their proficiency in pronunciation (Anderson-Hsieh, 1992; 1994; 1994). So, a lot of effort has been made to evaluate the efficiency and the amount of feedback of computer in teaching pronunciation and oral skills of the target language. Researchers have started moving from a focus on segments or individual phonemes to the suprasegmental or prosody like stress, intonation, and pause. These elements impact a native speaker's judgment of second or foreign language learners' accent (Bax, 2003).

3.5. Significance of Praat software as a CALL Tool

Praat (the Dutch word for "talk" or "speak") is a free scientific computer software for the analysis of speech in phonetics. It was programmed and continues to be developed, by Paul Boersma and David Weenink. This software also supports speech synthesis, including articulatory synthesis. Praat is one of the most commonly used programs for the purpose of speech analysis among linguists. (Boersma & Weenink, 2015).

Wilson's (2005) study refers to the advantages of Praat to teach segmental and suprasegmental pronunciation such as vowels and diphthongs. He says some features like vowel length differences before voiced and voiceless stop or voice onset time or intonation and stress can be shown and measure by this software. After being taught by the teacher on the use of Praat, students are capable of recording and analyzing their own pronunciation. Students first recorded speech by selecting Record mono sound (or stereo) from the menu of Praat objects window. After recording and saving it to the Praat objects window (by clicking on save to list in the sound Recorder window that pops up), the acoustic signal may be observed by clicking on the Edit button (visible when an object exists in the Praat objects)

3.6. Current Movements in Voice-Interactive CALL

During recent years, a growing number of speech workrooms have begun positioning technology of speech in CALL applications. The results contain voice-interactive sample systems for the teaching of reading, pronunciation, and restricted conversational abilities in semi-constrained frameworks.

The review of these applications is remote from in-depth. It covers a selected number of commonly investigational systems that discover paths we found encouraging and worth following. We will talk about the range of voice interactions

that these methods provide for practicing certain language abilities, explain their technical execution, and remark on the pedagogical significance of these performances. Apart from providing a brief method overview, we report investigational results if available and offer an assessment of how far the technology is being organized in the commercial and educational backgrounds.

3.6.1. Pronunciation Training

A valuable and significantly successful application of speech recognition and processing technology has been revealed by some business and research laboratories in the pronunciation practice area. Voice-interactive pronunciation instructors encourage students to repeat articulated words and sentences or to read aloud sentences in the target language for the purpose of performing both the sounds and the intonation of the language. The significant factor in teaching pronunciation successfully is helpful feedback. A useful feedback is expressly, a type of feedback that is not dependent on the student's own perception. Some experimental systems have applied automatic pronunciation recording as a mean to assess spoken learner productions regarding fluency, segmental quality (phonemes) and supra-segmental features (intonation). The automatically generated proficiency mark can then be applied as a basis for offering other modes of corrective feedback.

3.6.2. Segmental Feedback

Theoretically, planning an instructor for voice-interactive pronunciation which is needed by commercial dictation systems is very difficult. While the vocabulary and grammar of a pronunciation instructor are relatively straightforward, the essential speech processing technology will have a tendency to be complex since it must be customized to recognize and evaluate the speech fluency of language learners. A conservative speech recognizer is considered to produce an essential reading of a speaker's statement. Acoustic prototypes are widespread so as to accept and recognize a broad range of different accents and pronunciations correctly. A pronunciation instructor, by contrast, must be well trained to identify and rectify subtle deviations from standard pronunciations of native.

Some of the techniques have been offered for automatic recognition and non-native speech scoring (Franco, Neumeyer, Kim, & Ronen, 1997; Bernstein, 1997; Kim, Franco, & Neumeyer, 1997; Witt & Young, 1997). The procedure includes

building native pronunciation patterns and then assessing the non-native replies against the native models. It requires models trained in both the native and non-native speech data in the target language and enhanced by a set of algorithms for calculating acoustic variables that have been recognized useful in distinguishing native speech from non-native one. These variables embrace latency of the response, duration of the segment, inter-word pauses (in sentences), spectral probability, and fundamental frequency (F0). Machine marks are measured from statistics originated by comparing values of non-native of these variables with models of the native.

In a final step, machine created pronunciation scores are certified by linking these scores with the conclusion of human professional listeners. As it may be expected, the accuracy of the scores grows up with the duration of the statement that is to be evaluated. Stanford Research Institute (SRI) has established a 0.44 correlation at the phone level between machine scores and human scores. The machine-human correlation was 0.58 at the sentence level, and it was 0.72 at the speaker level for 50 utterances per speaker (Kim et al., 1997; Franco et al., 1997). These outcomes compare with 0.65, 0.55, and 0.80 for utterance, speaker, phone level and the correlation between human score graders. A study led at Entropic illustrates that on the basis of about 20 to 30 statements per speaker and a linear combination of the techniques that mentioned above, it is possible to acquire machine-human grader correlation levels of 0.85 (Bernstein, 1997).

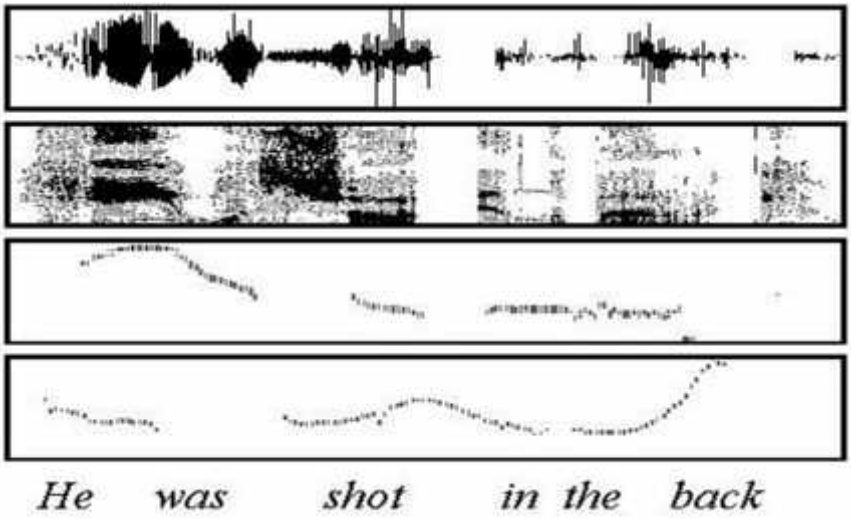
3.6.3. Supra-segmental Feedback.

Proper use of supra-segmental features of English language such as intonation and stress have been used to enhance the syntactic and semantic intelligibility of spoken language (Crystal, 1981). In a spoken conversation, intonation and stress information help listeners to identify phrase boundaries and the emphasis of words. They also recognize the practical thrust of the utterance (e.g., interrogative vs. declarative). One of the primary acoustical links of stress and intonation is fundamental frequency (F0); other acoustical features include duration, loudness, and speed. Most commercial signal processing software have certain tools for tracking and visually displaying F0 contours (see Figure 3.1). Such demonstrations have been used to offer good pronunciation feedback to students. Tests have shown that a visual F0 demonstration of supra-segmental structures joined with the audio response is more in

effect than audio feedback alone (de Bot, 1983; James, 1976), especially if the student's F0 contour is showed along with a native model. The feasibility of this type of visual feedback has been demonstrated by some simple examples (Anderson-Hsieh, 1994; Abberton & Fourcin, 1975; Hiller et al., 1994; Spaai & Hermes, 1993; Stibbard, 1996). We can believe that this technological tool has a decent potential for being merged into commercial CALL structures.

Other sorts of visual pronunciation feedback contain the graphical presentation of a native speaker's face, the vocal tract, speech waveforms and spectrum information (see Figure 3.1). Experiments have proved that a visual display of the talker enhances not only the accuracy in identifying words (Bernstein & Christian, 1996), but it also increases the speech rhythm and timing (Markham & Nagano-Madesen, 1997). A lot of commercial pronunciation instructors on nowadays market suggest this type of feedback. Yet others have tested with using a real-time spectrogram or waveform demonstration of speech to deliver pronunciation feedback. Molholt (1990) and Manuel (1990) report subjective success in using such demonstrations along with guidance on how to read the displays to improve the pronunciation of suprasegmental qualities in L2 students of English. However, the authors do not offer experimental evidence for the efficiency of this type of graphical feedback.

Figure3.1: Sample Human Speech Analyzed Entropic's Signal Processing Software



3.7. Future Movements in Voice-Interactive CALL

In the earlier sectors, we looked at the current national of speech technology, talked over some of the features affecting recognition operation, and introduced some research samples that elucidate the range of speech-enabled CALL uses that are technically, pedagogically, and currently feasible. Except for a few investigative open response dialog structures, most of these structures are intended to teach and evaluate linguistic form (pronunciation, vocabulary study, fluency, or grammatical structure). Formal features can be clearly recognized and integrated into a focused task plan. It means that strong performance is probable. Moreover, mastering linguistic form remains an important component of L2 training, despite the importance of communication (Holland, 1995). Prolonged, concentrated practice of a huge number of items is still considered an effective means of expanding and reinforcing linguistic competence (Waters, 1994). However, such method is time-consuming. CALL can automate these features of language training, thus releasing up valuable class time that would otherwise be consumed on drills.

While such systems are a significant step in the correct direction, other more complex and ambitious remedies are conceivable, and no doubt anticipated. Imagine a student capable of accessing the Internet, finds the language of her or his choice, and tap into a popular voice-interactive multimedia language program that would deliver the equivalent of a whole first year of college coaching. The computer would assess the student's skill level and plan a course of study according to his or her requirements. Or think of expending the same Internet means and a set of high-level authoring instruments to link together a series of virtual confronts surrounding the task of discovering a flat apartment in Berlin. At least, one would hope that natural speech input capacity becomes a regular feature of any CALL method.

In the point of view of many teachers, these may still seem like remote goals, and yet we believe that they are not out of reach. In what follows, we recognize four of the most lasting issues in making speech-enabled language learning software and suggest how they can be resolved to empower a more extensive commercial application of speech technology in CALL.

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Chapter - 4

Application of CALL-based Approach for Current Study

CHAPTER 4

APPLICATION OF CALL-BASED APPROACH FOR CURRENT STUDY

4.1. An Introduction to the CALL-based Approach of Current Study:

There are various methods available for teaching ESL learners in ELT and for this research, the CALL based approach teaching has been chosen for B.A final year students of Communicative English at AMU. In this chapter, the researcher has introduced and applied the CALL based approach teaching for teaching stress and intonation to 15 learners.

In this study, 15 male ESL students of Aligarh Muslim University enrolled in full-time B.A (English) course at final year were selected randomly as the sample of the study. The students were all of the intermediate-level proficiency and ranged in the age from 21 to 23 (mean age = 22 years). Participants reported having studied English for at least 17 years. The participants' native language background was Urdu. The B.A (English) students were chosen for this study as their normal curriculum involved the concept of stress and intonation learning tasks. Hence the current study experience would be suitable and intelligible for them as they were already familiar with the role of stress and intonation in English and it could provide a judgment about the efficiency of the proposed CALL based Approach. All 15 students were from India and were recruited because of their knowledge of linguistics and their ability to speak and write Standard English. All students were taught by the researcher with the same approach.

The CALL based method that the researcher applied was implemented with the help of different computer software and audiovisual aids like Laptop, Video projector, and sound speaker.

4.2. The Elements of Current CALL-based Approach

The digital tools and audio-visual aids that were used by the researcher were as follows:

- **Praat-Speech Analyzer**- Praat software is the main part of the CALL based approach of this research as it is used both in teaching and analyzing the data for pre-tests and post-tests. With the help of this software, the researcher analyzed

the native speaker's pronunciation and compared it with Learners' pronunciation. The use of this software significantly helped the learners to achieve an accurate pronunciation with correct syllable stress.

- **Computer**- the researcher used computer for running the Praat software and further analysis of native speaker and learners' voice analysis.
- **Video-Projector-** was used for graphical demonstration of native speaker's pronunciation sample. In this section, the researcher played several video lessons on different patterns of word syllable stress. These video lessons are provided by an American native speaker in her YouTube channel named JenniferESL.
- **Sound Speaker**- the researcher used a separate sound speaker to provide the learners clear sound and a better listening experiments while using the CALL methods.

4.3. The Implemented CALL-Based Method for Teaching Stress

For teaching the word syllable stress to the selected learners, with the help of CALL based approach, the researcher implemented the method in different steps. The steps that the researcher had taken are as follows:

4.3.1. Step 1: Oral Explanation

The researcher has started the procedure first by an oral explanation about the different possible patterns that can be used in stressing a syllable in a word. The reason for an oral explanation was to describe the learners about the importance of stress in communication and how learning about the stress can help one to sound intelligible while communicating with other speakers of the English language especially the native ones. The explanation then continued by describing different patterns that may be used in syllable stress of a different group of words.

The explained patterns for word stress according to Orion (1997) are as follows:

1. **A word can only have one stress.** In a very long word, we may have a secondary stress, but it is always a weaker stress.
2. **Only vowel sounds get stressed.** The English language vowels are; *a, e, i, o,* and *u*. The rest of letters in English are considered as consonants.

3. **Two-Syllable nouns and adjectives:** In most of two syllable **nouns** and **adjectives**, the first syllable gets the stress.

Examples:

- SAM-ples
- CAR-ton
- Col-or-ful
- RAI-ny

4. **Two-Syllable prepositions and verbs:** In most two syllable **prepositions** and **verbs**, the stress is on the second syllable.

Examples:

- re-LAX
- Re-CEIVE
- di-RECT
- a-MONG

5. **More word stress patterns on two-syllable words**

About 80% of words containing two syllables get the stress on the first syllable. There are also exceptions, but very few adjectives and nouns get stress on the location of the second syllable. Prepositions and verbs usually get stress placed on the second syllable, but there are exceptions to this too.

- a-SIDE
- bet-WEEN

6. **Three-Syllable words**

For three syllable words, we should look at the word ending (the suffix), using the following as the guide.

- **Words ending in "er", "or", "ly"**

For words that end with the suffixes "**or"**, "**er"**, or "**ly"**, the stress is put on the first syllable.

Examples:

- OR-der/OR-der-ly
- MA-nage/MA-nag-er

- **Words ending with consonants and "*y* "**

If the word ends in a **consonant** or a "**y",** then the first syllable gets the stress. **Examples:**

- RA-ri-ty
- OP-ti-mal
- GRA-di-ent
- CON-tain-er

- **Words with various endings**

By looking look at the list of suffixes below (suffixes are word endings), we can understand that the stress is going to come on the syllable right before the suffix. It applies to words of all syllable lengths.

Examples:

- **able:** ADDable, DURable
- **ary:** PRIMary, DIary, LIBrary
- **cial:** juDIcial, unSOcial
- **cian:** muSIcian, phySIcian, cliNICian
- **ery:** BAkery, SCEnery
- **graphy:** calLIgraphy, bibliOgraphy, stenOgraphy
- **ial:** celesTIal, iniTIal, juDICial
- **ian:** coMEdian, ciVILian, techNIcian
- **ible:** VISible, TERRible, reSIstible
- **ic:** arCHAic, plaTOnic, synTHEtic
- **ical:** MAgical, LOgical, CRItical
- **ics:** diaBEtics, paediAtrics
- **ion:** classifiCAtion, repoSItion, vegeTAtion
- **ity:** imMUnity, GRAvity, VAnity
- **ium:** HElium, aluMINium, PREmium
- **imum:** MInimum, MAXimum, OPtimum
- **logy:** BILogy, carDIOlogy, raDIOlogy
- **tal:** biCOAStal, reCItal

7. Words ending in “ee”, “ese”, “ique” and “ette”

Words that use the suffix “**ee”**, “**ese”**, “**eer”**, “**ique”** or “**ette”**, have the primary stress placed on the suffix. It is applicable to words of all syllable lengths.

Examples:

- **ee:** agrEE, jamborEE, guarantEE
- **eer:** sightsEER, puppetEER
- **ese:** SiamESE, JapanESE, cheESE
- **ette:** cassETTE, CorvETTE, towelETTE
- **ique:** unIQUE, physIQUE

8. Prefixes

Usually, prefixes do not take the stress of a word. There are a few exceptions to this rule, however, like “**un”**, “**in”**, “**pre”**, “**ex”** and “**mis”**, which are all stressed in their prefix.

Examples:

- **ex:** eXAMple, explaNAtion, eXAMine
- **in:** INside, INefficient, INterest
- **mis:** MIstake, MISspelled
- **pre:** PREcede, PREarrange, PRELiminary

9. Stress on the syllable

The stress is put on the penultimate syllable of the word, with words ending in “**ic”**, “**sion”** and “**tion”**.

Examples:

- i-COnic
- hy-per-TEN-sion
- nu-TRI-tion

10. Stress on the third from end syllable

The stress falls on the third from end syllable with words that end in **cy**, **ty**, **phy**, **gy** and **al**.

Examples:

- deMOCracy

- TREAty
- geOgraphy
- Allergy
- NAUtical

11. Word stress for compound words

- **Compound noun**

A compound noun is a noun that is made up of two other nouns to form one word. In a compound noun, usually, the first word takes on the stress.

Examples:

- SEAfood
- ICEland
- TOOTHpaste

- **Compound adjectives**

A compound adjective is made of at least two words. Often, hyphens are used in compound adjectives. In compound adjectives, the stress is placed on the second word.

Examples:

- ten-ME-ter
- rock-SO-lid
- Fif-teen-MI-nute

- **Compound verbs**

A compound verb is when the subject of the sentence has two or more verbs. The stress is then placed on the second or the last part.

Examples:

- Matilda loves bread but de-TESTS butter.
- Sarah baked cookies and ATE them up.
- Dogs love to eat bones and love DRIN-king water.

- **Noun + compound nouns:**

Noun + Compound Nouns are two-word compound nouns. In this type of word (noun + compound noun), the stress is placed on the first word.

Examples:

- AIR-plane mechanic
- PRO-ject manager
- BOARD-room member

12. Phrasal verbs

Phrasal verbs are words that are made of a preposition and a verb. In such cases, the stress will fall on the second word (the preposition).

Examples:

- Black OUT
- break DOWN
- look OUT

13. Proper nouns

Proper nouns are the specific names of places, people, or things. For instance; Jeniffer, Spain, Google. For this kind of words, the second word always gets the stress.

Examples:

- North DAKOTA
- Mr. SMITH
- Apple INCORPORATED

14. Reflexive pronouns

Reflexive pronouns demonstrate the action affects the person who performs the action. For example; *I hurt myself*. The second syllable usually takes the stress.

Examples:

- mySELF
- ThemSELVES
- OurSELVES

15. Numbers

For figuring out the stressed syllable for a number; if that number is a multiple of ten, the stress is then placed on the first syllable.

Examples:

- NINEty
- FIF-ty
- ONE-hundred

(Orion, 1997)

4.3.2 Step 2: Demonstrating Video Lessons of Native Speaker's Sample Pronunciation

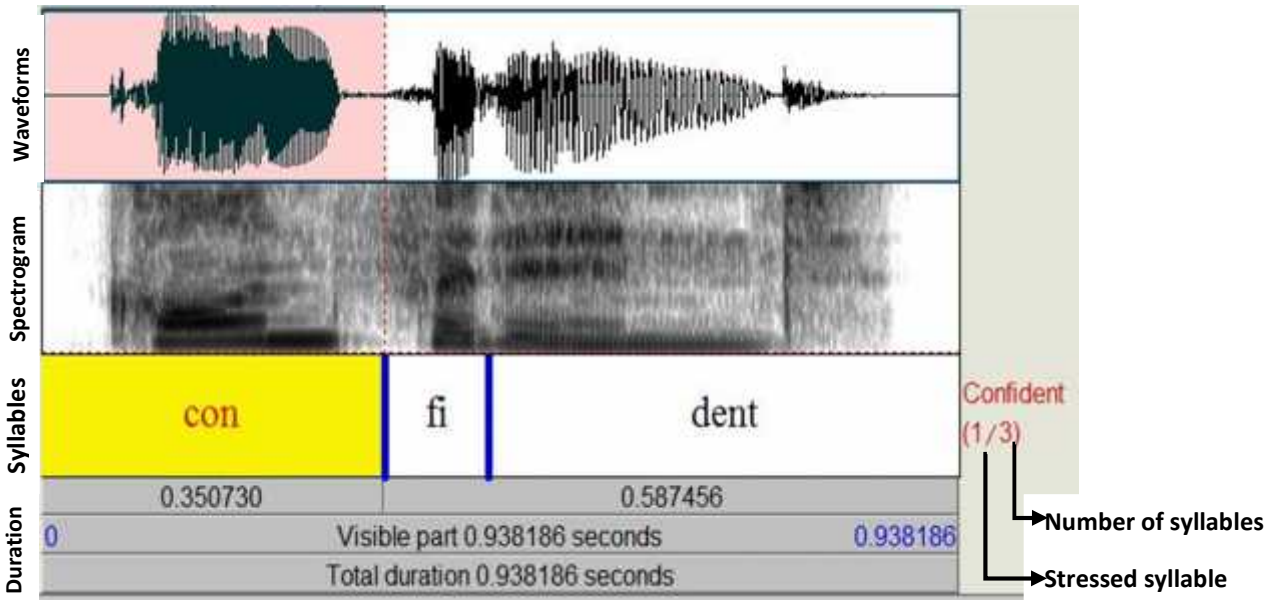
After the oral explanation about the different patterns of syllable stress in English, in this step, the researcher demonstrated the related video lessons on syllable stress pronunciation. The lessons were chosen from JenniferESL YouTube (JenniferESL, 2008) channel as a sample of American native speaker's pronunciation. While listening to the native speaker's pronunciation, the researcher then explained the syllable stress pattern of each word pronounced in video lessons and asked the learners to identify the related pattern which he orally explained them in the previous step.

4.3.3. Step 3: Making Digital Voice Analysis with Praat Speech Analyzer

In this part, the researcher with the help of Praat-Speech Analyzer and a laptop computer, demonstrate the digital analysis of the native speaker's voice for the pronunciation of different words with different structures. At this step, the researcher showed the students how a correct pronunciation is identifiable through Praat software and how they should accurately pronounce the stressed syllable, so the software will accordingly show the proper analysis.

Figure 4.1 in next page shows a sample voice analysis of tri-syllabic word "confident" uttered by the native speaker.

Figure 4.1: Sample of Native Speaker's Digital Voice Analysis for Assessing Word Stress



4.3.3.1. Analyzing Intelligibility of an Utterance with Praat Software

A digital voice analysis done by Praat software contains many elements for the purpose of intelligibility analysis such as pitch level, formants, pulses, intensity, spectrogram, and waveforms. Since stress is manifested as a rise in pitch, greater intensity (loudness) or greater vowel length, we include analysis of waveforms and spectrograms for analysis of syllable stress in a word. We can follow the following standard procedures in Praat to analyze the stress.

As it is shown in Figure 4.1, the digital analysis done by Praat software consists of 3 parts; the first row shows the vocal analysis of the word, the second row displays the spectrogram of the pronounced word, and the third row shows the divided syllables of the word. Beneath the row that shows syllables of the word, time duration of each syllable and the total length of utterance for the word is mentioned.

In this example the word "confident" consists of three syllables; "con", "fi", and "dent". In Figure 4.1, the syllable section shows that the stressed syllable ("con") is highlighted from other syllables. In this figure, The two arrows on the lower right-hand side signifies that the digit "3" means the total number of syllables in the word and the digit "1" means that the first syllable gets the primary stress.

The first row in Figure 4.2 displays the sound waveform of the pronounced word. The waveform analysis in this figure shows more wave density on the first syllable which indicates that the first syllable gets the main stress.

The second row in Figure 4.1 displays the spectrogram of the pronounced word. The spectrogram analysis that is shown in the second section of this figure indicates the higher intensity in the pronunciation of the first syllable("con") which caused the left part of the spectrogram bar to get darker than the other regions and it signifies that the primary stress is on the first syllable.

4.3.4. Step 4: Enhancing Learners' Intelligibility for Word Stress through CALL

At this point, the learners know how the digital analysis through Praat speech analyzer software is done, and how it can help them in achieving an accurate and correct pronunciation. The researcher then asked each learner to approach the computer and pronounce a word chosen by the researcher while their pronunciation is getting recorded. The researcher then ran the digital analysis of learners' voice. After analyzing each learners' voice with Praat software, it was found that despite the verbal explanation by the researcher about the different patterns of syllable stress, many learners failed to put the proper stress on a word accurately. At this point, the researcher tried to explain every learner how to change the pitch of his voice, so the outcome of the digital analysis would be close to the analysis of native speaker. By digitally analyzing learners' voice samples and comparing it with the native speaker's digital voice analysis, learners could identify their fault in syllable stress. With the help of voice analysis performed by Praat software, the learners could identify which syllable they wrongly put stress on and how they should change the pitch of their voice to put the correct stress on the target syllable accurately. Every pronunciation done by learner was again digitally analyzed and compared to the native speaker's, and the necessary instruction was given to the learners by the researcher to reduce their pronunciation errors.

The following procedure was repeated for every learner until they could accurately put the proper stress on the target word according to the digital analysis and making comparison with the native speaker's stress.

All learners seemed to be interested in the method above as they have never experienced this approach of teaching stress before. They believed that using CALL

materials would help them efficiently in learning word stress. They asserted that using digital analysis helped them to find their pronunciation error which the traditional methods of teaching stress was unable to achieve.

4.4. Applied CALL Method for Teaching Intonation

In this section, the researcher applied a CALL based approach teaching method for teaching the same 15 learners who were chosen for Pre-test 1 and post-test 1 for teaching syllable stress. The learners were chosen from B.A (English) students of Department of English, Aligarh Muslim University.

The CALL based method that the researcher applied was implemented with the help of different computer software and audiovisual aids like Laptop, Video projector, and sound speaker.

The digital tools and audio-visual aids used by the researcher are as follow:

- **Praat-Speech Analyzer**- with the help of this Software the researcher analyzed the native speaker's pronunciation and compared it with Learners' pronunciation. The use of this software effectively helped the learners to achieve an accurate pronunciation with sentence intonation.
- **Computer**- the researcher used computer for running the Praat software and further analysis of native speaker and learners' voice analysis.
- **Video-Projector-** was used for graphical demonstration of native speaker's pronunciation sample. In this section, the researcher played several video lessons on different patterns of word syllable stress. These video lessons are provided by an American native speaker in her YouTube channel named JenniferESL.
- **Sound Speaker**- the researcher, used a separate sound speaker to provide the learners clear sound and a better listening experience while learning through the CALL method.

For teaching sentence intonation to the selected learners, with the help of CALL based approach, the researcher implemented the method in various steps. The steps that the researcher had taken shall be explained as follows:

4.4.1. Step 1: Oral Explanation

The researcher started the procedure first by an oral explanation about the different possible patterns that can be used in sentence intonation in an utterance. The reason for an oral explanation was to describe the learners about the importance of intonation in communication and how learning about the intonation can help one to sound intelligible while communicating with other speakers of the English language especially the native ones. The explanation then continued by describing different patterns that may be used in the intonation of different sentences.

The explained patterns according to Orion (1997) are as follows:

1- Falling Tone (↘)

(The pitch of the voice drops at the end of the sentence.)

Falling intonation is the most common intonation pattern in the English language. It is usually found in commands, statements, wh-questions (information questions), confirmatory question tags, and exclamations.

- **Statements**
  - Nice to meet ↘you.
  - I’ ll be back in a ↘minute.
  - She does not live here ↘anymore.
  - Dad wants to change his ↘car.
- **Commands**
  - Write your name ↘here.
  - Show me what you’ ve ↘written.
  - Leave it on the ↘desk.
  - Put it ↘ down.
- **Wh- questions** (requesting information.)

  (questions starting with 'why', 'who', 'what', , 'where', 'when', 'which', and 'how')

- which country do you come ↘from?
- Where do you ↘work?

- Which of them do you ↘prefer?
- When does the shop ↘open?

- **Questions Tags that are statements that request confirmation instead of questions.**

  Every tag question is not a real question. Some of them simply expect confirmation or invite agreement to speakers' statement, in which we use falling tone at the end.

- He thinks he's so smart, ↘ doesn't he?
- She is such a trouble, ↘ isn't she?
- I failed the exam because I didn't study, ↘ did I?
- It doesn't seem to bother him much, ↘does it?

- **Exclamations**
  - How nice of ↘ you!
  - That's just what I ↘need!
  - You don't ↘ say!
  - What a beautiful ↘ voice!

2- Rising Tone (↗)

(The pitch of the voice increases at the end of a sentence.)

Rising intonation asks the speaker to continue talking. It is usually used with yes/no questions, and question tags that are real questions.

- **Yes/no Questions**

(Questions that can be answered by 'yes' or 'no'.)

- Do you like your new ↗teacher?
- Have you finished ↗already?
- May I borrow your ↗dictionary?
- Do you have any ↗magazine?

- **Questions tags that express uncertainty and require an answer** (real questions).

- We've met already, ↗haven't we?

- You like fish, ↗don't you?
- You're a new student ↗aren't you?
- The view is beautiful, ↗isn't it?

3- Combination of rising and falling intonation

We occasionally use a mix of rising and falling tone within the same sentence. This kind of combination is known as Rise-Fall or Fall-Rise intonation.

We apply rise-fall intonation for lists, choices, unfinished thoughts, conditional sentences, and.

- **Choices**
  - Are you having ↗soup or ↘salad?
  - Is John leaving on ↗Thursday or ↘Friday?
  - Does he speak ↗German or ↘French?
  - Is your name ↗Ava or ↘Eva?
- **Lists** (rising, rising, rising, falling)

  Intonation drops on the last item to show that the list is finished.
  - We've got ↗apples, ↗pears, ↗bananas and ↘oranges
  - The sweater comes in ↗blue, ↗white, ↗pink and ↘black
  - I like ↗football, ↗tennis, ↗basketball, and ↘volleyball.
  - I bought a ↗tee-shirt, a ↗skirt, and a ↘handbag.
- **Unfinished thoughts (partial statements)**

  In response to the following questions, the rise-fall intonation indicates reservation. The speaker hesitates to express his/her thoughts fully.
  - Do you like my new car? Well the ↗color is ↘nice... (but I don't like it.)
  - What was the meal like? Hmm, the ↗fish was ↘good... (but the rest wasn't great).
  - So you both live in Los Angeles? Well ↗Alex ↘does ... (but I don't).

- **Conditional sentences**

  (The tone rises in the first clause and falls gradually in the second clause.)

  - If he ↗calls, ask him to leave a ↘message.
  - Unless he ↗insists, I'm not going to ↘go.
  - If you have any ↗problems, just ↘contact us.

  ("Intonation in English pronunciation," 2015)

(Orion, 1997)

4.4.2. Step 2: Demonstrating Video Lessons of Native Speaker's Sample Pronunciation

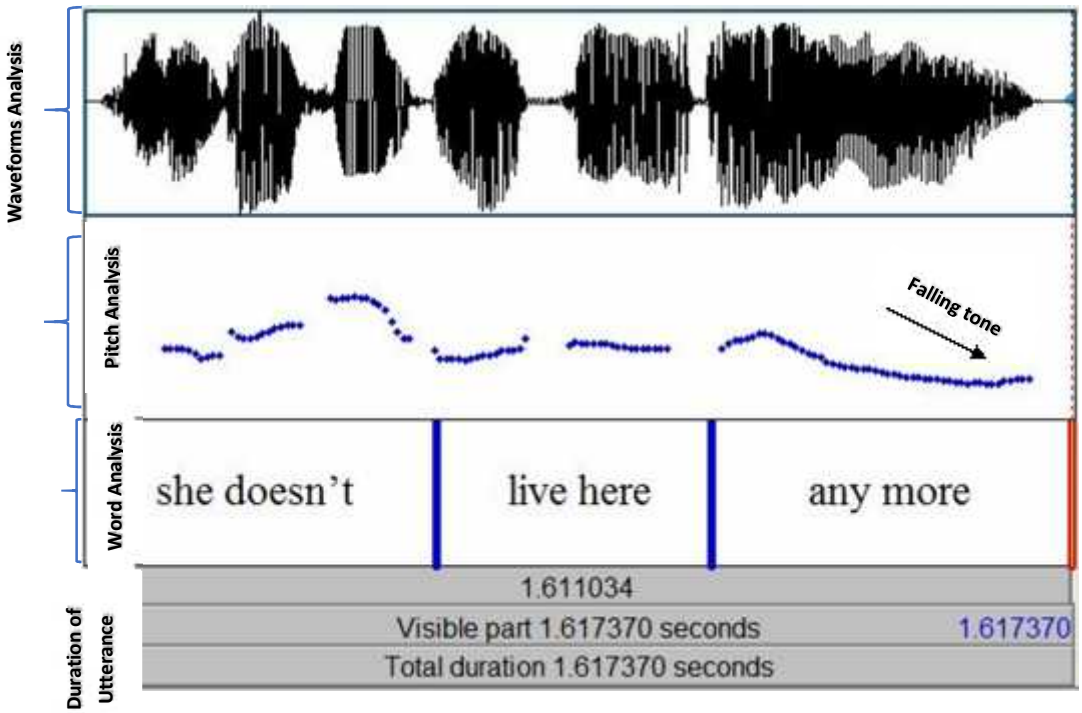
After the oral explanation about the different patterns of sentence intonation in English, in this step, the researcher demonstrated the related video lessons on sentence stress which essentially emphasized on native speaker's pronunciation. The lessons were chosen from JenniferESL YouTube (JenniferESL, 2008) channel as a sample of native speaker's pronunciation. While listening to the native speaker's pronunciation the researcher then explained the sentence intonation pattern of each word pronounced in video lessons and asked the learners to identify the related pattern which he orally explained them in previous step 1.

4.4.3. Step 3: Making Digital Voice Analysis with Praat-Speech Analyzer.

In this section, the researcher with the help of Praat-Speech Analyzer and a laptop computer, demonstrated the digital analysis of the native speaker's voice for the utterances of different sentence intonation with various patterns. At this step, the researcher showed the students how a correct intonation is identifiable through Praat software and how they should accurately utter the sentence, so the software will accordingly show the proper analysis.

Figure 4.2 shows a sample voice analysis of the sentence ending with falling tone "confident" uttered by the native speaker.

Figure 4.2: Sample Digital Voice Analysis of Native Speaker for Assessing Sentence Intonation



Praat software contains many elements for the purpose of speech analysis such as pitch level, formants, pulses, intensity, spectrogram, and waveforms. Since intonation is manifested as rise and fall of pitch, we include analysis of waveforms and pitch for the purpose of analyzing intonation in a sentence. We can follow the following standard procedures in Praat to analyze the sentence intonation.

The digital voice analysis in Figure 4.2 is done through Praat software. The analysis consists of four parts; the first part shows the related waveforms of uttered sentence. The second part which is the most important part in identifying intonation of an utterance demonstrates the pitch of the sound in a sentence. The third part is named word analysis which shows the parallel location of uttered words relating to the pitch analysis row or waveform analysis row. The final section shows the visible and total duration of the sentence. The descending arrow in this figure is manually drawn to effectively demonstrate the location of rising tone and falling tone in the pitch analysis.

4.4.4. Step 4: Enhancing Learners' Intelligibility for Sentence Intonation through CALL

At this point, the learners know how the digital analysis through Praat speech analyzer software is done, and how it can help them in achieving an accurate and correct intonation. The researcher then asked each learner to approach the computer and utter a sentence chosen by the researcher while their utterance is being recorded. The researcher then ran the digital analysis of learners' voice with Praat software. After analyzing each learners' voice with Praat software, we found that despite the verbal explanation by the researcher about the different patterns of sentence intonation, many learners failed to put the proper stress in a word accurately. At this point, the researcher tried to explain every learner how to change the tone of his voice, so the outcome of the digital analysis will be close to the native speaker. By digitally analyzing learners' voice samples and comparing it with the native speaker's digital voice analysis, learners could identify their fault in the intonation of the sentence. With the help of voice analysis performed by Praat software, the learners could determine where in a sentence they should produce the proper tone and how they should change the tone of their voice to accurately produce the correct intonation close to the native speaker's one. Every sentence uttered by the learner was again digitally analyzed and compared to the native speaker's one, and the necessary instruction was given to the learners by the researcher to reduce their pronunciation errors.

The graphical figure of different learners' digital voice analysis has been demonstrated in the next chapter of this thesis.

The following procedure was repeated for every learner until they could accurately produce the proper tone in uttering the target sentences according to the digital analysis and its comparison with the native speaker's one.

All learners seemed to be interested in the method above as they have never experienced this method of teaching intonation before. They believed that using CALL materials help them efficiently in learning sentence intonation. They asserted that using digital analysis helped them to find their error in their utterances which the traditional methods of teaching failed to achieve.

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Chapter - 5

Analysis of the Collected Data for the Related Test on Word Stress

CHAPTER 5

ANALYSIS OF THE COLLECTED DATA FOR RELATED TESTS ON WORD STRESS

5.1. Introduction

In this study, the researcher took four days for conducting various steps of data collection such as conducting pre-tests, post-tests, and intelligibility tests for teaching stress and intonation to Non-native Speakers (NNS) of English. The following chapter will explain and analyze the collected data from NNS of English.

5.2. Participants

In this study, 15 male ESL students of Aligarh Muslim University enrolled in full-time B.A(English)course at final year were selected randomly as the sample of the study. The students were all of the intermediate-level proficiency and ranged in age from 21 to 23 (mean age = 22 years). Participants reported having previously studied English for at least 17 years. The participants' native language was Urdu. The B.A(English) students were chosen for this study because their normal curriculum involved the concept of stress and intonation learning tasks. Hence the current study experience would be suitable and intelligible for them as they are already familiar with the role of stress and intonation in English and it can give a judgment about the efficiency of the proposed CALL based Approach. All 15 students were from India and were recruited because of their knowledge of linguistics and their ability to speak Standard English. All the students were taught by the same researcher and same approach.

5.3. Procedures

There are various methods available for collecting data such as questionnaire, interview, observation and test paper, etc. For gathering information about the subject of AMU, the researcher chose the CALL-Based Approach to teach the students. In this study, two paper pre-tests and two paper post-tests were taken from the students before teaching stress and intonation.

The following tasks were conducted among the learners:

1. Pre-test1

2. Post-test1
3. Intelligibility test of Pre-test1

4. Intelligibility test of Post-test1
5. Pre-test2
6. Post-test2
7. Intelligibility test of Pre-test2
8. Intelligibility test of Post-test2

Each of the aforesaid tests consisted of 30 exercises.

The whole data collection procedure consists of 8 different phases which can be stated as follows:

1- Conducting and collecting Pre-test1(Appendix1)for identifying word syllable stress

2- Conducting and collecting voice recording task of each student in Pre-test1 for the purpose of intelligibility analysis.

3- Conducting and collecting Post-test1 (Appendix 2) for identifying word syllable stress and further analysis and comparison to Pre-test1.

4- Conducting and collecting voice recording task of each student in Post-test1 for intelligibility analysis and further comparison with intelligibility analysis results of Pre-test1.

5- Conducting and collecting Pre-test2 (Appendix 3) for identifying the intonation of the sentences.

6- Conducting and collecting voice recording task of each student for Pre-test2 for the purpose of intelligibility analysis.

7- Conducting and collecting Post-test2 (Appendix 4) for identifying the intonation of the sentence and further analysis and comparison to Pre-test2.

8- Conducting and collecting voice recording task of each student for Post-test2 for further analysis and comparison with Pre-test2.

5.4. Phase 1: Conducting Pre-test1 (Word Stress)

In this phase, a set of 30 questions in the form of *Pre-test1* (Appendix1)were distributed among each of 15 learners (1 set of the same questions for each learner). The questions in this test were designed to measure the learners' capability in

identifying primary stressed syllable of different multi-syllabic words. Before conducting Pre-test1, no teaching activity or method was applied on the students. The duration of the test was 15 mins.

5.4.1. The Structure of Pre-test1

Pre-test1 consists of 30 questions. Every question contains a multisyllabic word which its syllables are split with a tick box next to each syllable. The learner must tick mark the primary stressed syllable of the word according to his knowledge and prior to any teaching activity by the researcher. The researcher has tried to choose the words according to different factors which may affect the stress pattern. Some of these words are:

- Words ending with different suffixes like; *-ive, -ent, -iency, -ous, -ian, -ic, -al, -ent, -tion, -ty.*
- Words that can be used in different forms like verb and noun, example: suspect, present
- Compound words such as *book-store, warehouse, neighborhood*, etc.

For the following test a combination of eight four-syllabic words, 17 tri-syllabic words and five bisyllabic words were chosen.

5.4.2. Data Analysis of Pre-test1 Conducted in Phase1

Data analysis of Pre-test1 that is conducted within Phase1 can be stated as follows:

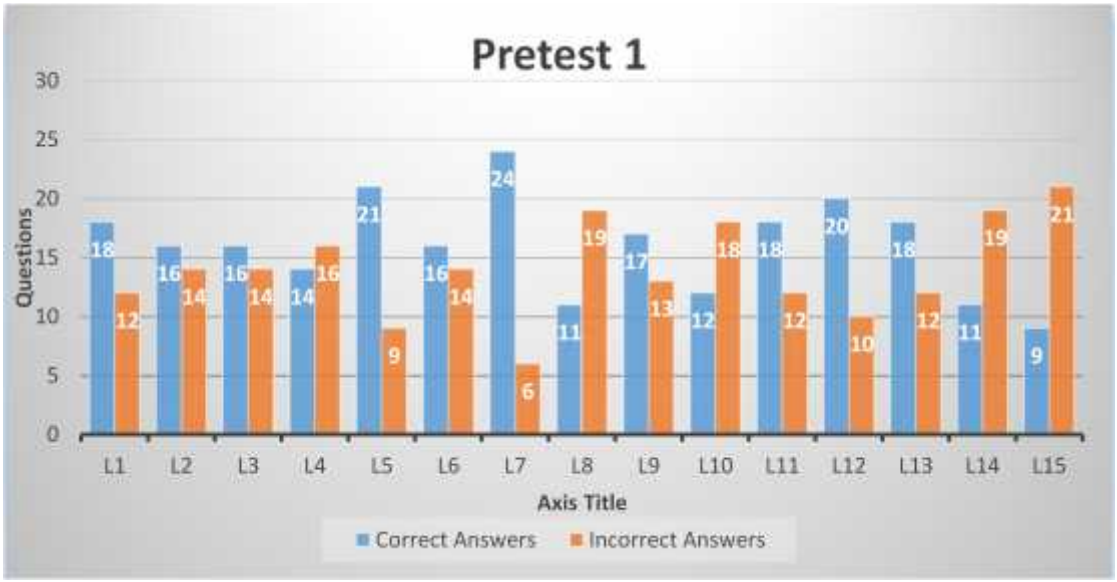
In Pre-test1, 15 learners were examined that were named from L1 to L15 where the letter “L” stands for “Learner”. Table 5.1 shows every learner’s obtained score (number of correct answers) along with the correct answer percentage of each learner. After analyzing the data provided in Table 5.1, we found that average score obtained by the student is 16 correct answers out of 30 questions and correct answers percentage of a total number of students is 46%. We also found that 67% (10 learners) of the learner scored at least 50% of correct answers.

Table 5.1 Scores and Percentage of Correct Answers Obtained by Learners in Pre-test1

ID	Correct Answers	% of Correct Answers
L1	18	60%
L2	16	53%
L3	16	53%
L4	14	47%
L5	21	70%
L6	16	53%
L7	24	80%
L8	11	37%
L9	17	57%
L10	12	40%
L11	18	60%
L12	20	67%
L13	18	60%
L14	11	37%
L15	9	30%
Total Questions:	30	

The chart in Figure 5.1 also demonstrates a comparison between correct answers and incorrect answers of each learner (L1 to L15) by relatively showing the number of correct and wrong answers on top of each bar for each learner.

Figure5.1: Comparison of Correct Answers and Incorrect Answers of Learners in Pre-test1



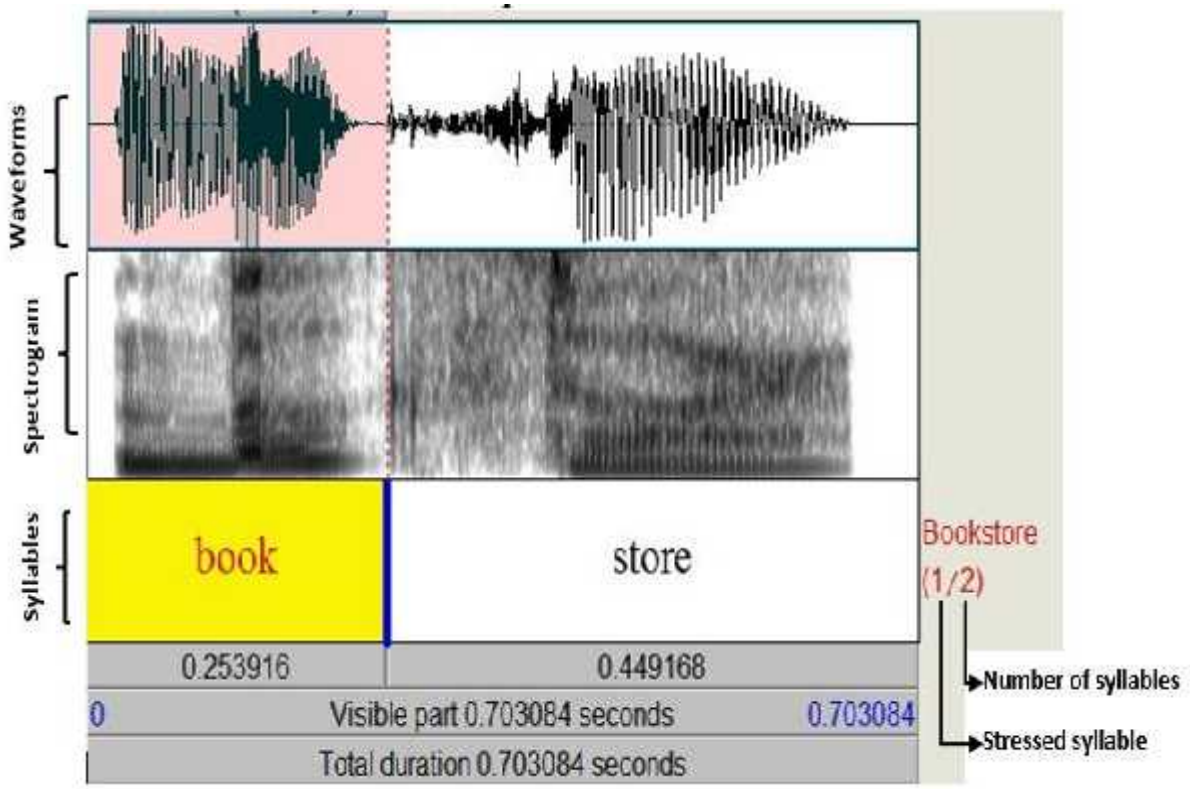
5.5. Phase 2: Conducting Learners' Intelligibility Test for Pre-test1

After conducting and completing Pre-test1 by the researcher and learners, in this phase, the researcher asked every learner to read out the words with the same stress pattern that they chose to be correct in their Pre-test1. The researcher then started to collect voice samples by recording every learner's voice for the pronunciation of each word for further intelligibility analysis with Praat voice analyzer software.

5.5.1 Determining the Intelligibility of an Utterance through Praat Software.

For analyzing the intelligibility of voice samples of learners, the researcher needed to compare them with a native speakers' voice samples. We started this procedure by demonstrating the digital voice analysis of each word pronounced by a native speaker with the help of Praat software. Since there was no access to a native speaker in Aligarh Muslim University at the time of data collection, hence the researcher used an internet-based Text to Speech(TTS) machine which is provided in www.oddcast.com website. This TTS machine provides a clear natural human voice for the pronunciation of words or sentences with proper stress and intonation. It is also capable of pronouncing words and sentences in different English accents such as British, American, Australian, etc. the researcher used American English accent for his pronunciation sample as the American English speakers are considered as native English speakers with the help of Praat Software.

Figure 5.2: Digital Analysis of an Intelligible Utterance by a Native Speaker



Since stress is manifested as the greater intensity (loudness), the rise in pitch or greater vowel length, the analysis of stress must embrace various elements of acoustic analysis, like spectrogram, waveform, and pitch contour.We can follow the following standard procedure in Praat to analyze the stress.

As it is shown in Figure 5.2, the digital analysis done by Praat software consists of 3 parts; the first row shows the vocal analysis of the word, the second row displays the spectrogram of the pronounced word, and the third row shows the divided syllables of the word. Beneath the row that shows syllables of the word, time duration of each syllable and total duration of utterance for the word is mentioned.

In this example, the word “bookstore” consisted of two syllables; “book” and “store”. In Figure 5.2, in the syllable section the stressed syllable (book)is highlighted from other syllables and on the two arrows on the lower right-hand side of the figure, the digit “2” shows the total number of syllables in the word and the digit “1” signifies that the first syllable gets the primary stress.

5.5.2. Elements of a Digital Voice Analysis in Praat Software for Word Stress.

- **Spectrogram Analysis**

The second row in Figure 5.2 displays the spectrogram of the pronounced word. The spectrogram analysis that is shown in the second section in this figure indicates the higher density or intensity in the pronunciation of the first syllable(book) which caused the left part of the spectrogram bar to get darker than the other part, and it signifies that the primary stress is on the first syllable.

Spectrogram analysis is one of the factors that the researcher used for determining intelligibility of learners' utterances by comparing it with spectrogram analysis of native speaker's voice.

- **Waveforms Analysis**

The first row in Figure 5.2 displays the sound waveforms of the pronounced word. The waveform analysis in this figure shows more wave density on the first syllable which indicates that the first syllable gets the main stress.

Waveforms Analysis is also another factor that the researcher used for determining intelligibility of learners' utterances by comparing it with the waveforms analysis of native speaker's voice.

In this research, we determined and evaluated the intelligibility of learner's utterances by analyzing and then comparing them with the native speaker's utterances for the same word. The whole process of intelligibility analysis of learners' utterances is done through Praat software.

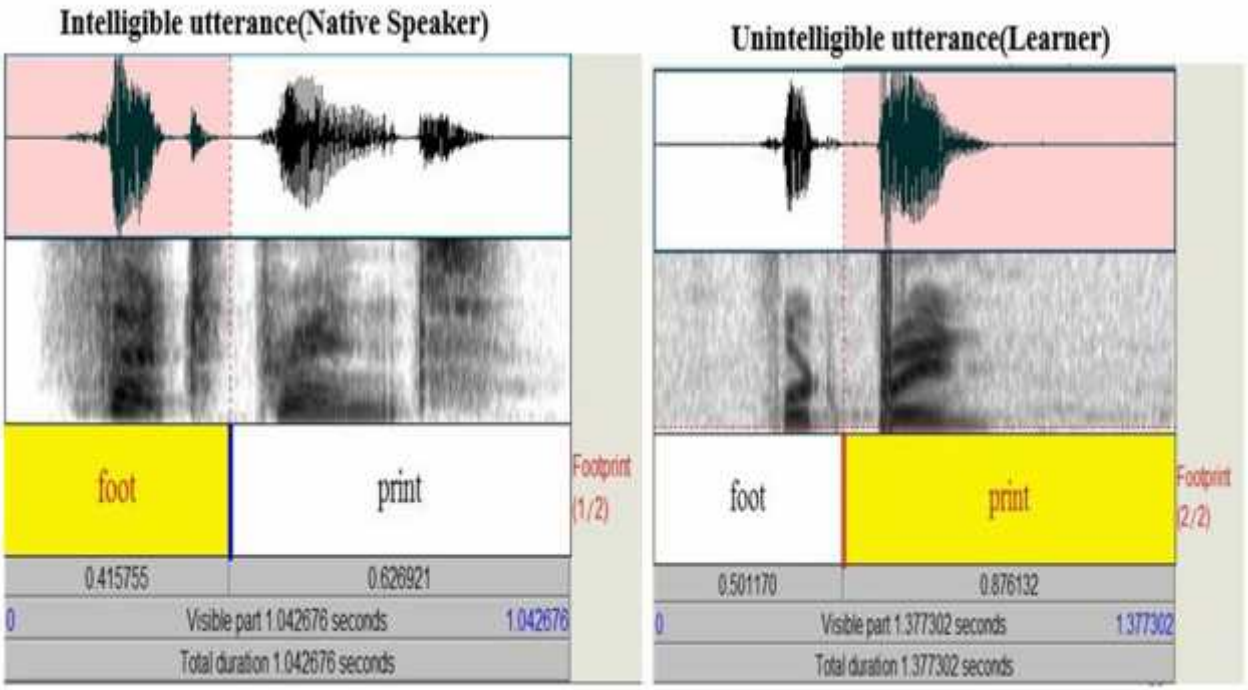
5.5.3. Sample Voice Analysis and Comparison of a Native Speaker and Learner for Intelligibility Evaluation of Pre-test1

In this chapter the researcher makes a computerized comparison of voice sample uttered by native speaker and learners and will calculate the average intelligibility of learners in pronouncing with proper stress. The researcher has mentioned the digital analysis of eight words, and then he chose the voice sample of the same words from eight random learners. In order to demonstrate an understandable result, the researcher chose eight words with different number of

syllables ranged from two-syllable words to four-syllable words from Pre-test1 to compare with the voice sample of learners for intelligibility evaluation.

In this test, we consider Leaner's utterance as an intelligible utterance if its digital analysis is somehow similar or matches the digital analysis of native speaker's pronunciation. The digital voice analysis of these words pronounced by the native speaker is as follows.

Figure 5.3: Intelligibility Analysis of Word Stress Done by Praat Software for Native Speaker and Nonnative Speaker (Learner)



As it is shown in the above figure, the intelligibility of a learner's or nonnative speaker's (NNS) utterance is determined by comparing its digital analysis with the native speaker's (NS) utterance.

This figure shows the digital analysis of Praat software for the word "footprint" which is uttered by both the native speaker (left part of the figure) and learner (right part of the figure).

The digital analysis of native speaker's utterance shows that there is a significant waveforms density and voice intensity on the first syllable of the word which shows that the native speaker intelligibly pronounced the word with correct stress.

The digital analysis of learner's utterance shows that the waveforms density and voice intensity is incorrectly on the second syllable of the word which shows that the learner's utterance is not intelligible according to the software pronounced the word with correct stress.

5.5.4. Intelligibility Analysis and Comparison of Native Speaker and Learners' Digital Voice Samples for Pre-test1

The following figures demonstrate the native speaker and learners 'digital voice analysis for the following words; efficient, electrician, eventual, negative, sensitive, spacious, sufficiency, and suspect.

Figure 5.4: Native Speaker's Intelligibility Analysis for the Word "efficient"

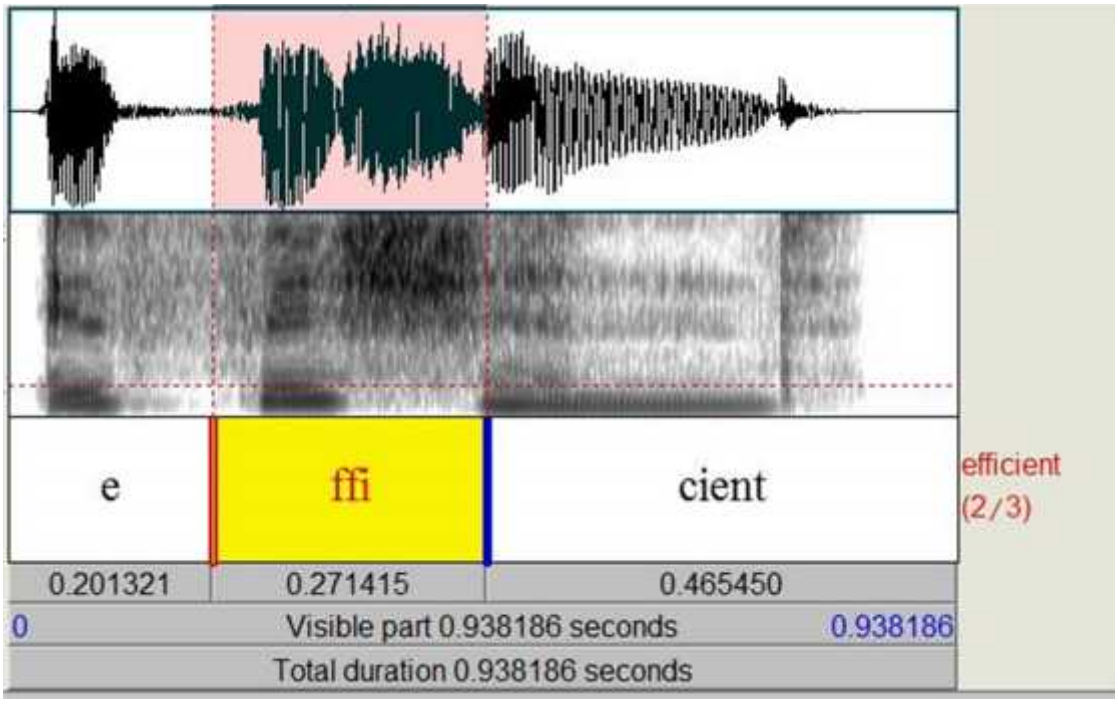


Figure 5.4 shows the native speaker's voice analysis for the word "efficient". As per the analysis provided in the above figure, we can observe that the word "efficient" contains three syllables. The wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, shows that the correct primary stress is on the second syllable /*ffi*/ as the density of waveforms and the extra darkness of spectrogram analysis on the area of this syllables shows the intensity of sound is considerably more than the other syllables.

As per the stress patterns explained in the previous chapter, the word “efficient” should get stressed on the second syllable and the native speaker intelligibly pronounced the word with correct stress. Hence NS’s voice sample is suitable for evaluating intelligibility of NNS’ pronunciation.

Figure 5.5: Learner’s Intelligibility Analysis for the Word “efficient.”

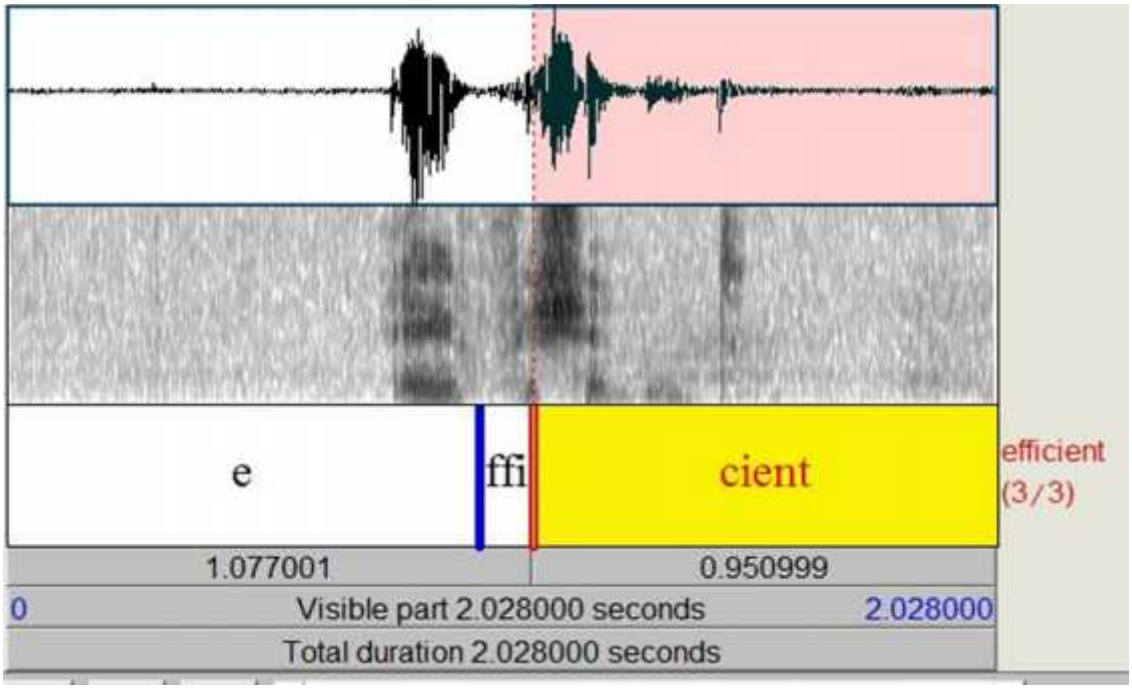


Figure 5.5 shows the digital analysis of Learner 7’s pronunciation. As it is shown in this figure, the learner didn’t quite do well in the pronunciation of the word “efficient”. With a close and analytical look at the digital voice analysis of Learner 7, we notice that the density of waveforms in his voice is slightly on the third syllable(“cient”). Even by observing the spectrogram analysis section we notice that there is rather more intensity of voice on the third syllable compared to other syllables which all signifies that the learner failed to pronounce the word with correct stress and his pronunciation he has mistakenly put the stress on the third syllable.

While comparing Figure 5.5 to Figure 5.4 where the same word is pronounced by the native speaker with proper stress, we understand that in Figure 5.5, it is very difficult to separate the syllables by analyzing according to waveforms or

spectrogram. Moreover, it is very difficult to find the stressed syllable (even if it is wrongly stressed) due to learner's flat and non-intonational way of pronunciation.

Figure 5.6: Native Speaker's Intelligibility Analysis for the Word "eventual"

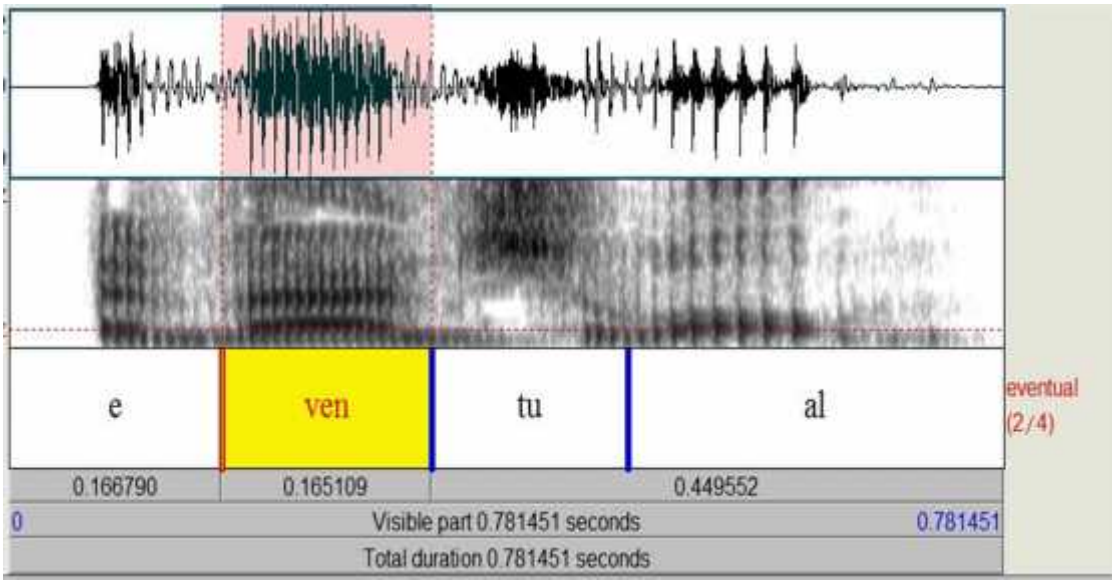


Figure 5.6 shows the native speaker's voice analysis for the word "eventual". As per analysis provided in the above figure we can observe that the word "eventual" contains four syllables. The wave density analysis provided on waveforms row and the spectrogram analysis on the spectrogram row, it is identifiable that the stress is on the second syllable ("*ven*"). The waves on this syllable are longer and higher, and the voice intensity on this syllable is considerably more than the other syllables.

The above analysis of NS's pronunciation shows the suitable intelligibility of his utterance hence it is a suitable sample for learner's intelligibility evaluation.

Figure 5.7: Learner's Intelligibility Analysis for the Word "eventual"

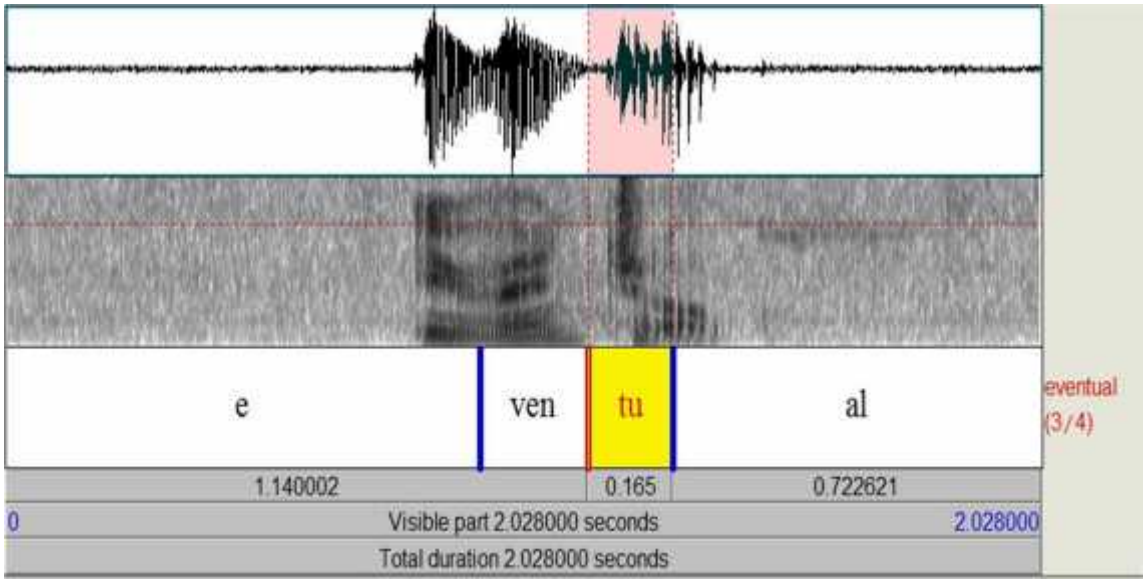


Figure 5.7 shows Learner 9's digital voice analysis for the word "eventual". The analysis depicted in this shows that the learners' pronunciation is not intelligible for the software. The length and height of the waveforms on this digital analysis are almost the same on each syllable, and the intensity of learner's voice is equally spread throughout the digital analysis, and it is very difficult to find a syllable which got the prominent waveforms or more intensity of voice.

Hence the above analysis reveals that NNS's pronunciation for word stress is unintelligible.

Figure 5.8: Native Speaker's Intelligibility Analysis for the Word "electrician"

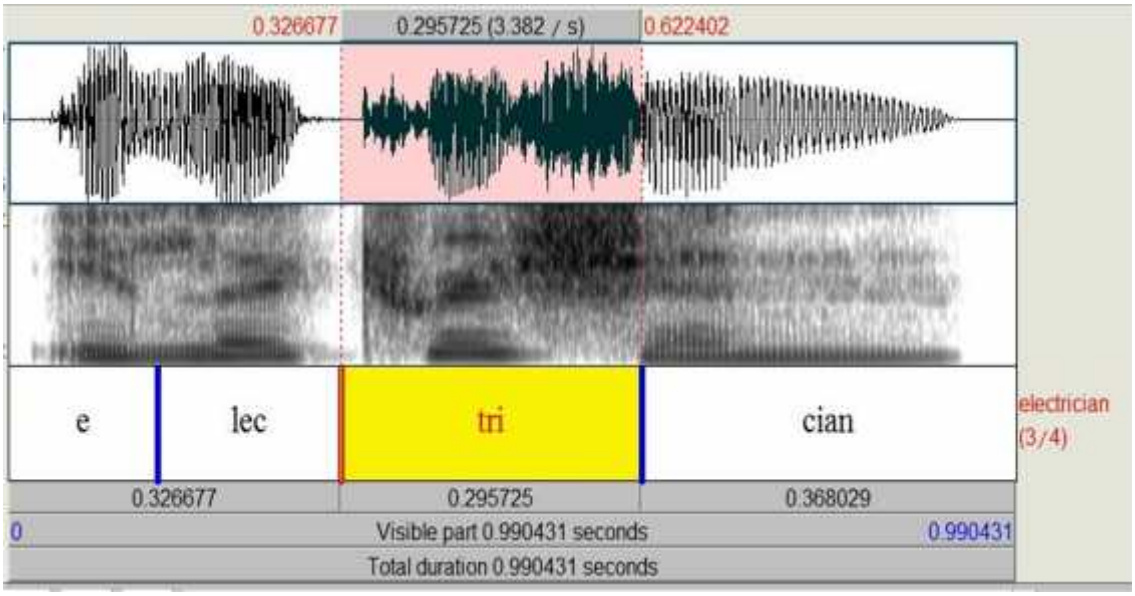


Figure 5.8 shows the native speaker's voice analysis for the word "electrician". As per the analysis provided in above figure, we can observe that the word "electrician" contains four syllables. According to the wave density analysis provided on the waveforms row and the spectrogram analysis on the spectrogram row, it is identifiable that the stress is put on the third syllable (*"tri"*).

According to the syllable stress patterns explained in the previous chapter, words ending with *"cian"* suffix, get the primary stress on the penultimate syllable. Hence the analysis in Figure 5.8 shows that the NS pronounced this word intelligibly with correct stress.

Figure 5.9: Learner's Intelligibility Analysis for the Word "electrician."

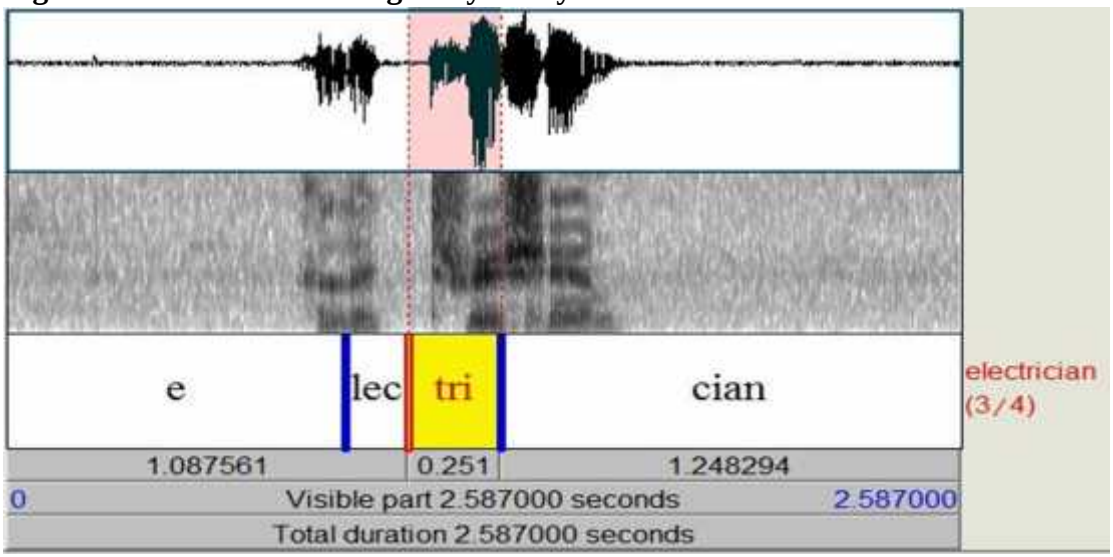


Figure 5.9 shows the digital voice analysis of Learner 12's pronunciation for intelligibility evaluation purpose. As it is shown in this figure, the learner made a correct pronunciation of the word "electrician". With a close and analytical look at the digital voice analysis of Learner 12 represented in above figure, we notice that the density and height of waveforms in his voice are more considerable on the third syllable("tri"). The spectrogram analysis section also shows that there is a bit more intensity of voice on the third syllable compared to other syllables which all signifies that the learner succeeded in pronouncing the word with correct stress and he has correctly put the stress on the third syllable.

Hence the above analysis shows that the learner had intelligibly pronounced the given word and the digital analysis shows the correct stressed syllable in this word.

While comparing Figure 5.9 to Figure 5.8 where the same word is pronounced by the native speaker with proper stress, we understand that in Figure 5.8, despite the stress is correctly made but it is still difficult to separate the first and second syllables. The waveforms and spectrogram analysis of Figure 5.9 even show that the pronunciation of last syllable is not continuous as well. According to the voice analysis of the native speaker provided in Figure 5.8, the waveforms, or spectrogram show a clear and identifiable pronunciation of each syllable which makes it very easy to count the syllables and find the stressed one due to proper pitch movement of the sound during pronunciation of the word.

Figure 5.10: Native Speaker's Intelligibility Analysis for the Word "sensitive"

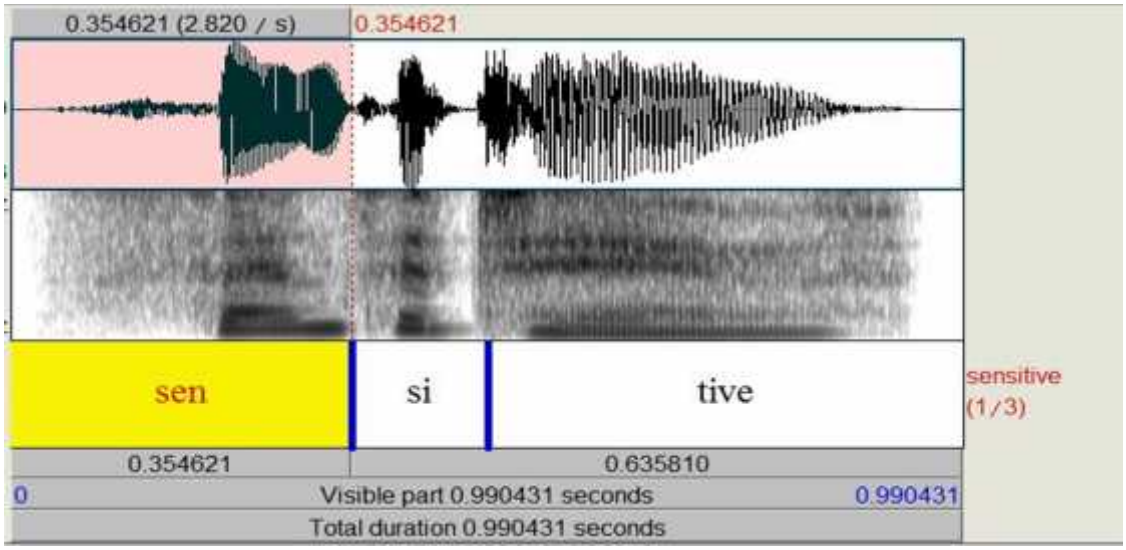


Figure 5.10 shows the native speaker's digital voice analysis for the word "sensitive". As per the analysis provided in this figure, we can observe that the word "sensitive" contains three syllables. According to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the correct primary stress has correctly fallen on the first syllable ("sen") as the density and height of waveforms, and the extra darkness of spectrogram analysis in the area of "sen" syllable is considerably more than the other syllables.

Hence the NS's pronunciation here is considered as an intelligible one, and it is suitable enough to be used for NNS' intelligibility evaluation.

Figure 5.11: Learner's Intelligibility Analysis for the Word "sensitive"

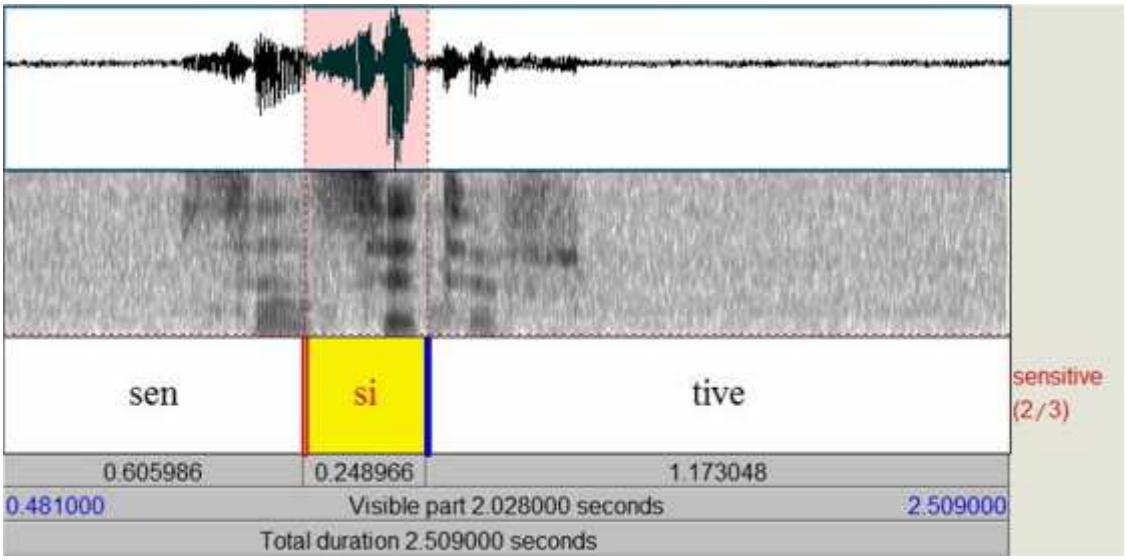


Figure 5.11 shows the digital analysis of Learner 3's voice for intelligibility evaluation purpose. As it is shown in this figure, the learner couldn't intelligibly pronounce the word with correct stress. With a close and analytical look at the digital voice analysis of Learner 3, we notice that the density and height of waveforms in his voice are more on the second syllable("*si*") instead of the first syllable. Even by observing the spectrogram analysis section we notice that there is more intensity of voice on the second syllable compared to other syllables which signifies that the learner failed in intelligibility test for this word as he pronounced the word with incorrect stress and he wrongly put the stress on the second syllable which led him in producing an unintelligible utterance.

While comparing Figure 5.11 to Figure 5.10 where the same word is pronounced by the native speakers as the sample of intelligible utterance, we understand that in Figure 5.11, besides the wrong stressed syllable by the learner, the waveforms show a weak voice intensity throughout the utterance which makes the utterance even less intelligible.

Figure 5.12: Native Speaker's Intelligibility Analysis for the Word "negative"

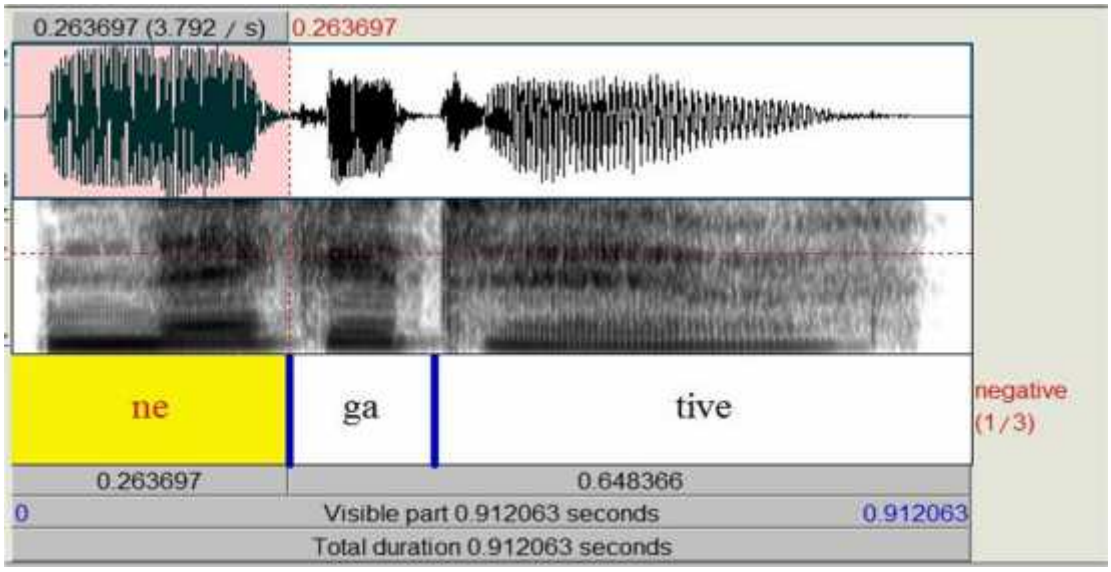


Figure 5.12 shows the native speaker's voice analysis for the word "negative". As per the analysis provided in this figure we can observe that the word "negative" contains three syllables and according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the wave density on the syllable("*ven*") is more intensive and the spectrogram analysis of voice intensity shows a darker density on this syllable as well which signifies this syllable as the correctly primary stressed syllable of the word and the pronunciation is quite intelligible for the software, and it can be compared to evaluate learners' intelligibility test.

Figure 5.13: Learner's Intelligibility Analysis for the Word "negative"

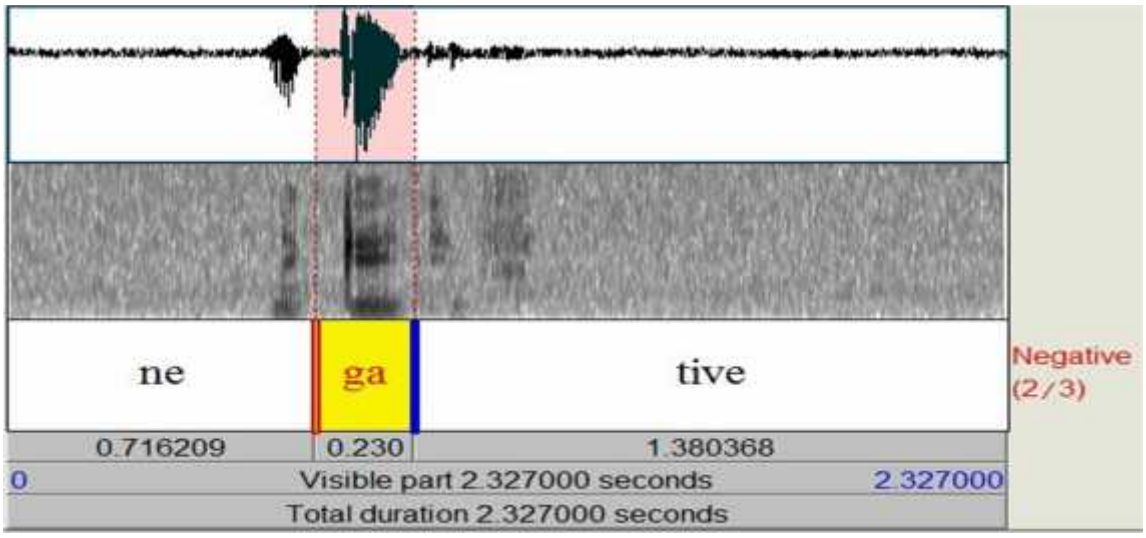


Figure 5.13 shows the digital analysis of Learner 11's voice for intelligibility evaluation purpose. As it is shown in this figure, the learner didn't do quite well in

intelligibility test for the pronunciation of the word “negative”. With a close and analytical look at the digital voice analysis of this learner, we notice that the density of waveforms in his voice is more on the second syllable(“ga”). Even by observing the spectrogram analysis section we notice that there is more intensity of voice on the second syllable compared to other syllables which all signifies that the learner couldn’t intelligibly pronounce this word and he put a wrong stress on the second syllable.

While comparing Figure 5.13 to Figure 5.12 where the same word is pronounced by the native speakers as a sample of intelligible utterance, we understand that in Figure 5.13, besides the wrong stressed syllable by the learner, the short and weak waveforms show a weak voice intensity throughout the utterance especially on the last syllable which adds to the unintelligibility of the learner’s pronunciation.

Figure 5.14: Native Speaker’s Intelligibility Analysis for the Word “spacious”

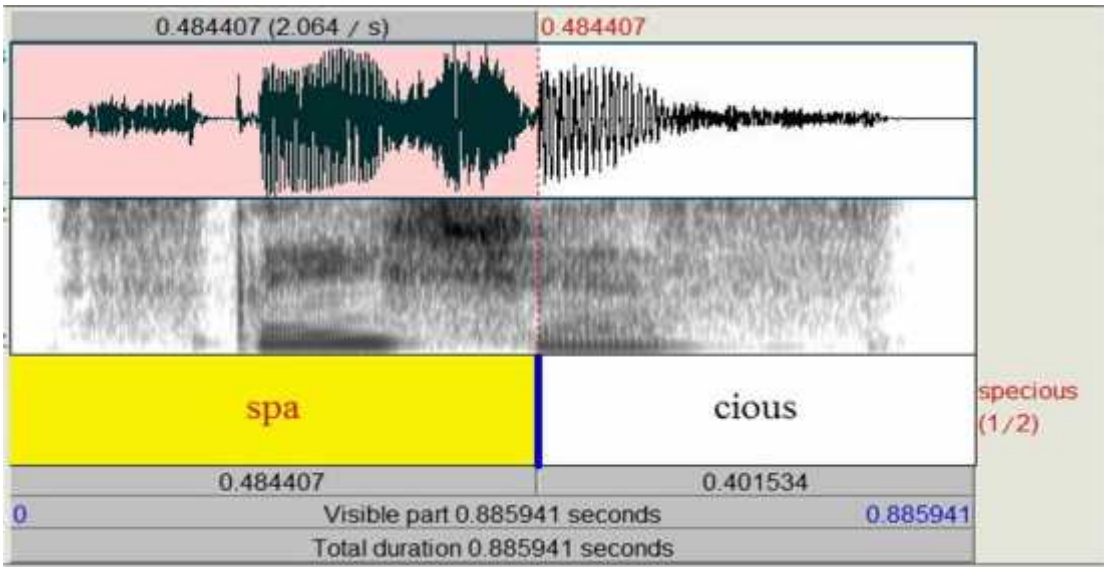


Figure 5.14 shows the native speaker’s digital voice analysis for the intelligibility evaluation purpose for the word “spacious”. As per the digital analysis provided in this figure we can observe that the word “spacious” contains two syllables and according to the wave density analysis provided on the waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the wave density and height on the syllable “*spa*” is more intensive, and the spectrogram analysis also shows a darker density on this syllable as well which points out this syllable as the correctly primary stressed syllable of the word.

Figure 5.15: Learner's Intelligibility Analysis for the Word "spacious."

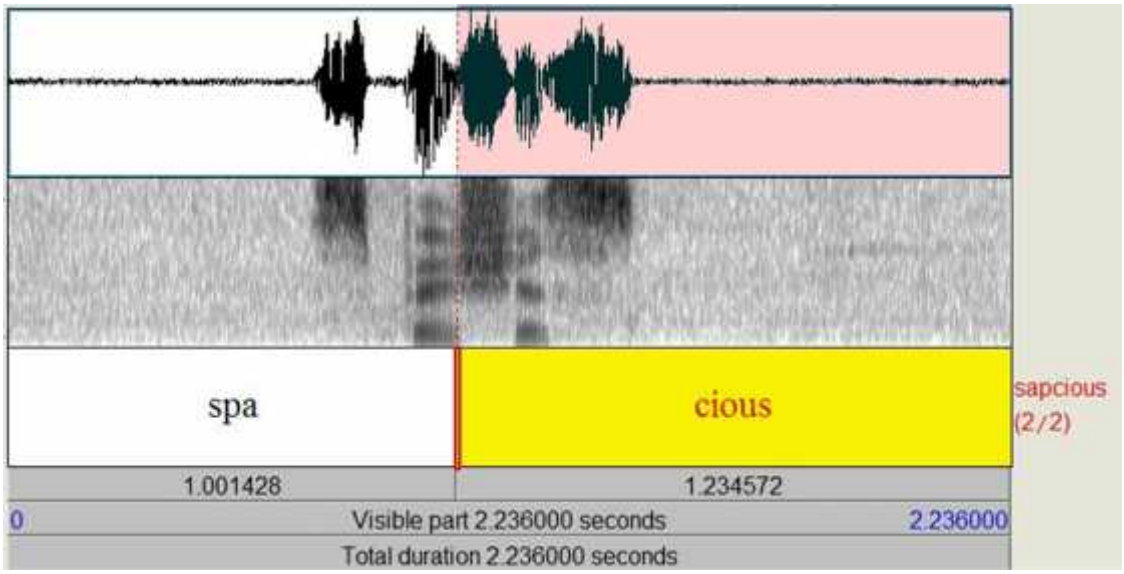


Figure 5.15 shows the digital voice analysis of Learner 6's pronunciation for intelligibility evaluation purpose. As it is shown in this figure, the learner couldn't properly pronounce the bisyllabic word "spacious". With a close and analytical look at the digital voice analysis of Learner 6, we notice that the density and height of waveforms in his voice are more on the second syllable ("*cious*") instead of the first one. Even by observing the spectrogram analysis section we notice that there is more intensity of voice on the second syllable compared to another syllable which signifies that the learner failed to pronounce the word with correct stress and he mistakenly put the stress on the second syllable. Hence in this utterance, learner's pronunciation is not intelligible compared to the native speaker's pronunciation of the same word.

While comparing Figure 5.15 to Figure 5.14 where the same word is pronounced by the native speaker with proper stress, we understand that in Figure 5.14, the native speaker maintained a very neat and clear pronunciation for the word "spacious". The spectrogram and waveform analysis shows a very intelligible and significant way of pronunciation which makes it very easy to find the stressed and unstressed syllables and separate them. On the contrary, while analyzing Figure 5.15, we can observe the unnecessary movement of the waveforms throughout both the syllables which shows the incorrect way of pronunciation uttered by Learner 6.

Figure 5.16: Native Speaker's Intelligibility Analysis for the Word "sufficiency"

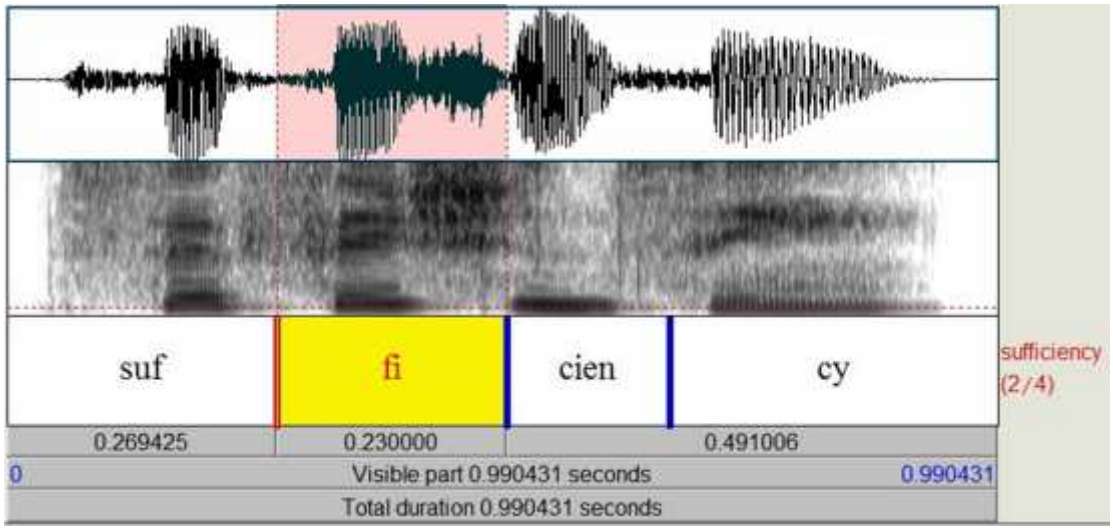


Figure 5.16 shows the native speaker's voice analysis for the word "sufficiency". As per analysis provided in this figure, we can observe that the word "sufficiency" contains four syllables. According to the wave density analysis provided on the waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the wave density in the second syllable ("*fi*") is more intensive. The spectrogram analysis demonstrates a darker density in the pronunciation of this syllable as well that correctly signifies this syllable as the primary stressed syllable of the word.So the NS here had pronounced the word intelligibly, and the analysis performed by software shows the correct stressed syllable of his utterance.

Figure 5.17: Learner's Intelligibility Analysis for the Word "sufficiency"

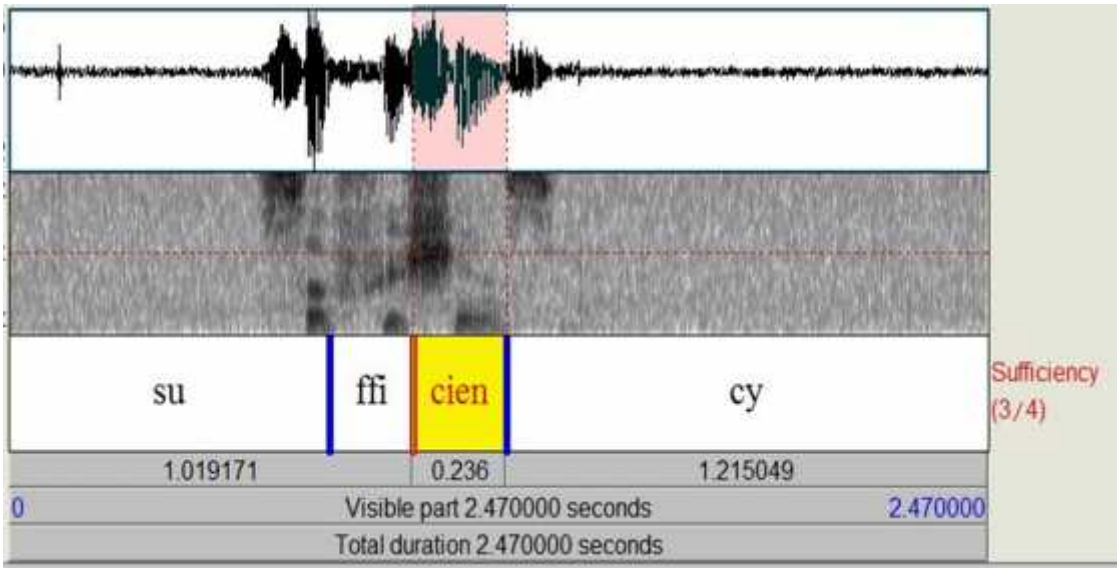


Figure 5.17 shows the digital voice analysis of Learner 2's utterance as a non-native speaker's pronunciation for intelligibility evaluation purpose. As it is shown in

this figure, the learner couldn't properly pronounce the four-syllabic word "sufficiency". With a close and analytical look at the digital voice analysis of this learner, we notice that the density of waveforms in his voice is more on the third syllable("*cien*") instead of the second syllable. Even by observing the spectrogram analysis section we notice that there is slightly more intensity of voice on the third syllable compare to second or other syllables which signify that the learner failed to pronounce the word with correct stress and he mistakenly put the stress on the second syllable.

While comparing Figure 5.17 to Figure 5.16 where the same word is pronounced by the native speaker, the waveforms and spectrogram analysis of the native speaker show that, he maintained a very neat and clear pronunciation for the same word. The spectrogram and waveform analysis shows a very intelligible and significant way of pronunciation which makes it very easy to find the stressed and unstressed syllables and separate them. On the contrary, while analyzing Figure 5.16, we can observe unnecessary pitch movement on the waveforms throughout the third syllables "*cien*" which shows the unintelligible way of pronunciation uttered by the learner.

According to the mentioned analysis, we understand that the learner's pronunciation was unintelligible for the software as the digital analysis and its comparison to the native speaker's voice analysis shows significant differences in the stressed syllable between the two utterances.

Figure 5.18: Native speaker's Intelligibility Analysis for the Word "suspect."

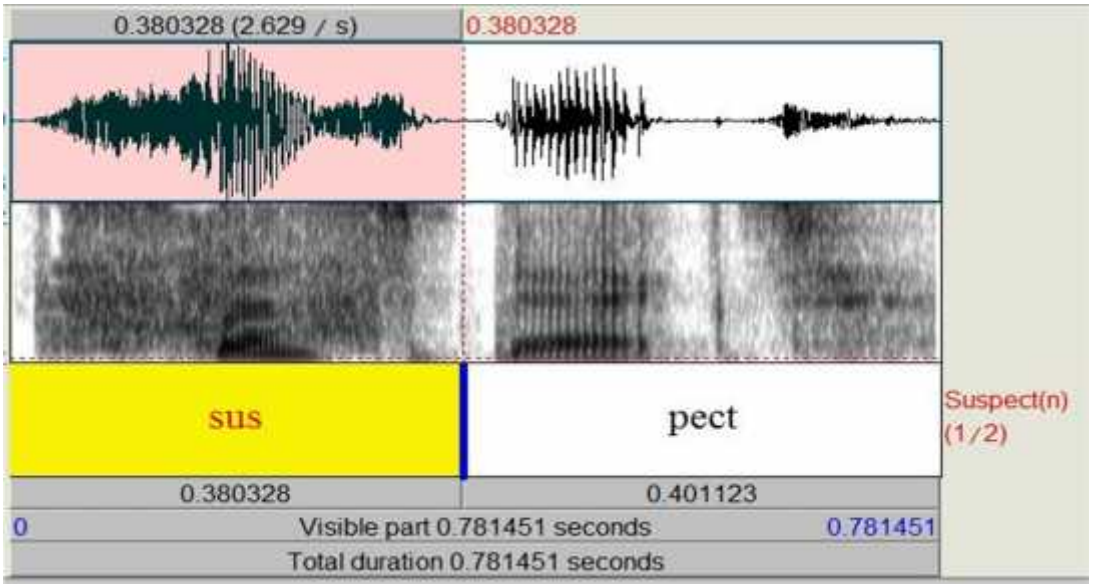


Figure 5.18 shows the native speaker's voice analysis for the word "suspect" which is pronounced as a noun. As per analysis provided in this figure we can observe that the word "suspect" contains two syllables, and according to wave density analysis provided on the waveform row and spectrogram analysis on the spectrogram row, it is identifiable that the wave density in the second syllable ("ven") is more intensive, and the spectrogram analysis shows a darker density on this syllable as well which correctly signifies this syllable as the correct primary stressed syllable of the word. Hence the NS's pronunciation for the mentioned word is considered as an intelligible one.

Figure 5.19: Learner's Intelligibility Analysis for the Word "suspect."

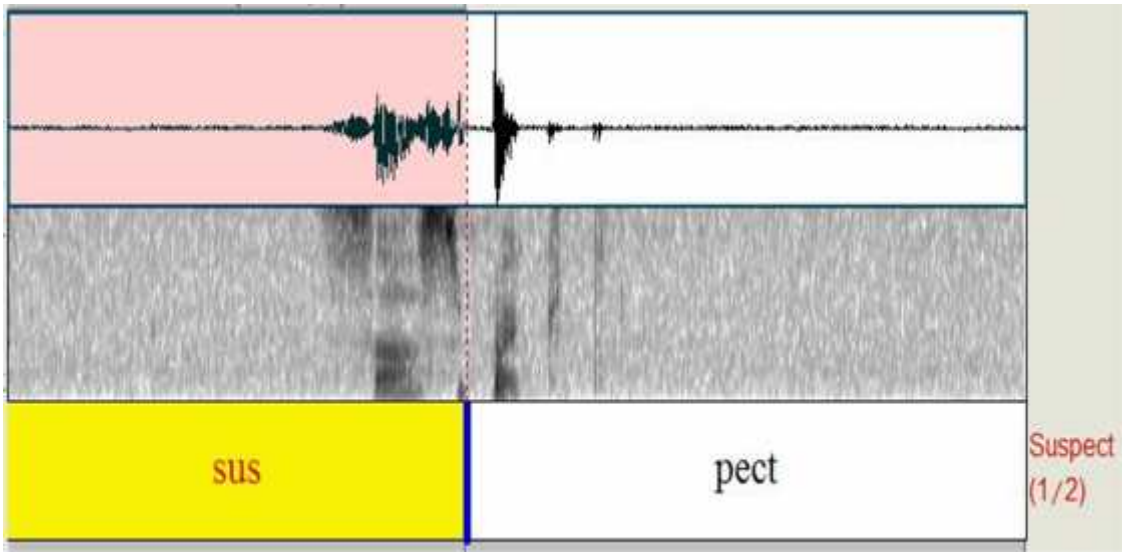


Figure 5.19 shows the digital voice analysis of Learner 11's pronunciation for intelligibility evaluation purpose. As it is shown in this figure, the learner had correctly pronounced the bisyllabic word "suspect" which is introduced as a noun. According to wave density analysis provided on the waveform row and spectrogram analysis on the spectrogram row, it is slightly identifiable that the wave density on the first syllable ("*sus*") is somehow more intensive though the spectrogram analysis in this figure shows a darker density on this syllable as well which signifies that the learners could slightly pronounce the word intelligibly with accurate stress.

Although the learner in this figure had uttered an intelligible pronunciation, but while comparing Figure 5.19 to Figure 5.18 where the same word is pronounced by the native speaker with proper stress, we understand that in Figure 5.18, the visible waveforms with suitable length and height show that the native speaker (NS) had

maintained a better and clear pronunciation compare to Non-Native Speaker (NNS) or learner.

5.5.5. Data Analysis of Intelligibility Test of Pretest1 Conducted in Phase2

After conducting the Phase 2 which was about testing the intelligibility of learners' utterances by recording their voice clips, then we measured their obtained score by calculating the number of intelligible utterances of each student. The intelligibility test for Pretest1 was done prior to application of CALL method. The aim of the intelligibility test for Pretest1 is to evaluate learners' skills about word stress prior to any teaching method.

Data analysis of Phase 2 can be stated as follows:

In intelligibility test for Pretest1, 15 learners were examined that were named from L1 to L15 where the letter "L" stands for "Learner". Table 5.2 shows every learner's obtained score (number of correct answers) along with the correct answer percentage of each learner. After analyzing the data provided in Table 5.2, we found that average score obtained by the student is 12.6 correct answers out of 30 questions and correct answers percentage of total number of students is 42%. We also found that 27% (4 learners) of the learner scored at least 50% of correct answers.

Table 5.2: Scores and Percentage of Correct Answers Obtained by Learners in Intelligibility Test for Pre-test1

ID	Correct Answer	% of Correct Answers
L1	14	47%
L2	13	43%
L3	10	33%
L4	11	37%
L5	16	53%
L6	12	40%
L7	20	67%
L8	9	30%
L9	12	40%
L10	7	23%
L11	16	53%
L12	17	57%
L13	14	47%
L14	10	33%
L15	9	30%
Total Questions:		30

5.6. Phase3: Conducting Post-test1 for Word Stress

In this phase, a set of 30 questions in the form of *Post-test1* (Appendix2)were distributed among each of 15 learners (1 set of the same questions for each learner). The purpose of conducting the Post-test1 is to measure the effectiveness of CALL based Approach of teaching applied by the researcher. The questions in Post-test1 were designed to measure the learners' capability in identifying primary stressed syllable of different multi-syllabic words. Pre-test1was conducted after applying the teaching activities and methods which were based on CALL approach. The duration of the test was 15 minutes.

After completing the Post-test1, the statistical result of the paper will be analyzed with the help of Microsoft Excel.

5.6.1. The Structure of Post-test1:

Post-test1 consists of 30 questions. Every question contains a multisyllabic word which its syllables are split with a tick box next to each syllable. The learner must tick-mark the primary stressed syllable of the word according to the instruction and method that are given by the researcher. The researcher has tried to provide the similar structure of words which he had provided in Pre-test1. The words, here again, were chosen according to different factors which may affect the syllable stress pattern. Some of these words are:

- Words ending with different suffixes like; *-ive, -ent, -iency, -ous, -ian, -ic, -al, -ent, -tion, -ty,* etc
- Words that can be used in different forms like verb and noun, example: *suspect, present*
- Compound words such as *footprint, warehouse*, etc.

For the following test a combination of six four-syllabic words, 15 tri-syllabic words and nine bisyllabic words were chosen.

The reason for choosing numerous tri-syllabic words is that most of the words which get prefix or suffix at their beginning or at their end are tri-syllabic.

5.6.2. Data Analysis of Phase 3:

Data analysis of Phase 3 can be stated as follows:

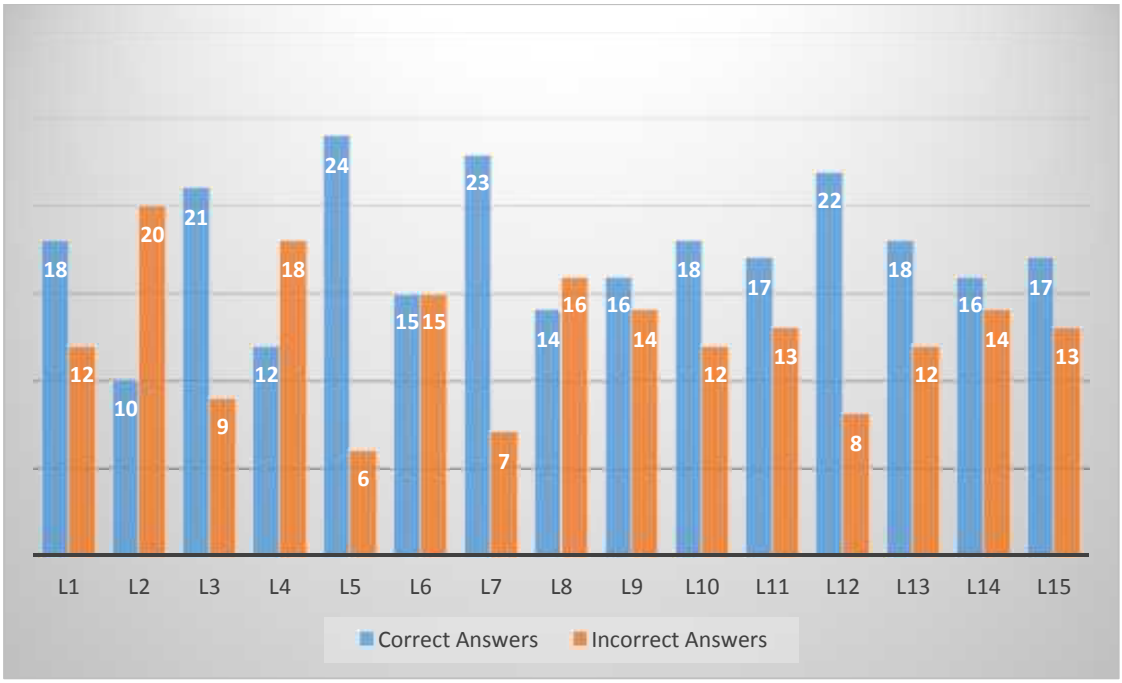
In Post-test1, 15 learners were examined that were named from L1 to L15 where the letter “L” stands for the word “Learner”. Table 5.3 shows every learner’s obtained score (number of correct answers) along with the correct answer percentage of each learner. After analyzing the data provided in Table 5.3, we found that average score of correct answers by total number of learners is 17.4 out of 30 questions which show that the correct answers percentage of total number of students is 58%. We also found that 80% (12 learners) of the learner scored at least 50% of the correct answers.

Table 5.3: Scores and Percentage of Correct Answers Obtained by Learners in Post-test1

ID	Correct answers	% of Correct answers
L1	18	60%
L2	10	33%
L3	21	70%
L4	12	40%
L5	24	80%
L6	15	50%
L7	23	77%
L8	14	47%
L9	16	53%
L10	18	60%
L11	17	57%
L12	22	73%
L13	18	60%
L14	16	53%
L15	17	57%
Total questions:	30	

The chart in Figure 5.20 also demonstrates a comparison between correct answers and wrong answers of each learner (L1 to L15) by relatively showing the number of correct and wrong answers on top of each bar for each learner.

Figure 5.20: Comparison of Correct Answers and Incorrect Answers of Learners in Post-test1



5.7. Phase 4: Conducting Learners' Intelligibility Test for Post-test1

After conducting and completing Post-test1 in this phase, the researcher asked every learner to read out the words with the same stress pattern that they believed to be correct in their Post-test1. The recording task was conducted to measure the impact of applied CALL methods on Learners' pronunciation intelligibility. The researcher then started to collect voice samples of learners by recording their voice clips for the pronunciation of each word for further pronunciation intelligibility analysis with Praat voice analyzer software.

5.7.1. Voice Analysis of Post-test1 for Intelligibility Evaluation of Learners

For analyzing the accuracy of voice samples of learners, the researcher needed to compare them with a native speakers' voice samples. This procedure was started by demonstrating the graphical voice analysis of each word pronounced by a native speaker with the help of Praat software.

In this study, a native speaker's pronunciation is considered as an intelligible pronunciation, and the intelligibility of learners' pronunciation will be compared and evaluated according to Native speaker's digital voice analysis. Since there was no access to a native speaker in Aligarh Muslim University at the time of data collection,

hence the researcher used an internet-based Text to Speech (TTS) machine which is provided in www.oddcast.com website. This TTS machine provides a clear natural human voice for the pronunciation of words or sentences with proper stress and intonation. It is also capable of pronouncing words and sentences in different English accents such as British, American, Australian, etc. The researcher used American English accent for the comparison of learners' pronunciation sample as the American English speakers are considered as native English speakers.

5.7.2. Sample Voice Analysis and Comparison of the Native Speaker and Learners for Post-test1

In this section, the researcher made a computerized comparison of voice sample uttered by native speaker and learners and analyzed the intelligibility of learners' utterance in pronouncing with proper syllable stress. Due to the limitation of pages in this chapter and to save paper the researcher mentioned the digital analysis of eight words and then he chose the voice sample of the same words from eight random learners for intelligibility analysis. In order to achieve a transparent and clear result, the researcher chose eight words with a different number of syllable ranged from two-syllable words to four-syllable words from Pre-test1 to compare with the voice sample of learners.

The selected words for demonstrating sample intelligibility analysis are as follows where the stressed syllable is capitalized.

- comPOSE(bisyllabic)
- ALtitude
- conCEPtual
- FOOTprint
- indiVIdual
- preSENT (Verb)
- surpRIsing
- productive

The digital voice analysis of these words pronounced by the Native Speaker (NS) and Nonnative Speaker (NNS) are as follows.

Figure 5.21: Native Speaker's Intelligibility Analysis for the Word "compose"

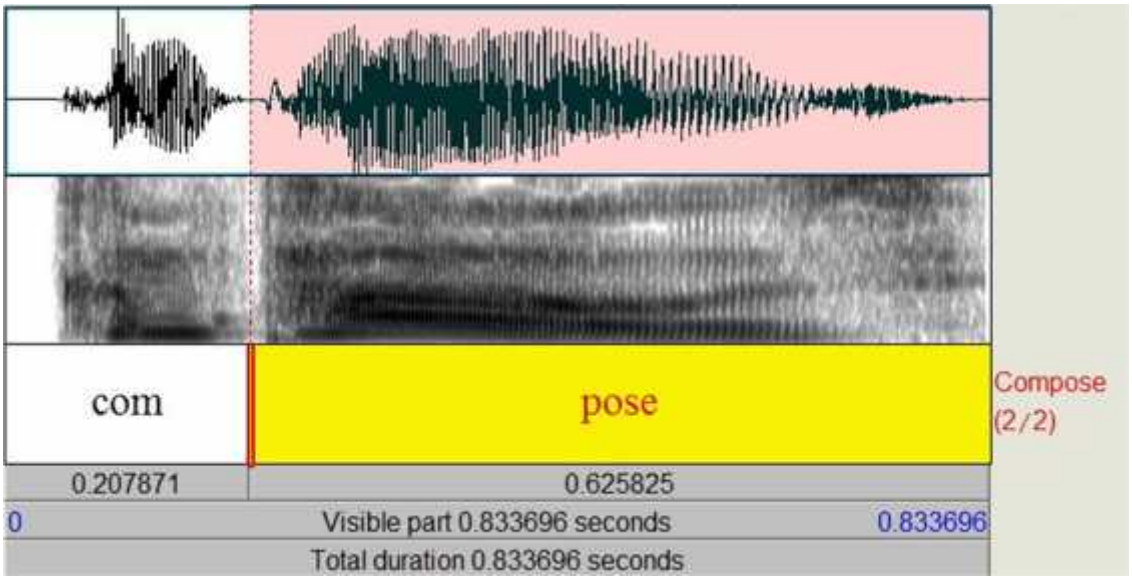


Figure 5.21 shows the native speaker's voice analysis for the word "compose". As per analysis provided in this figure we can observe that this word contains two syllables and according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the correct primary stress is fallen on the second syllable ("*pose*") as there is a visible density on waveforms and intensity on spectrogram analysis of this syllable.

According to the word stress patterns explained in the previous chapter, the NS has successfully pronounced the word with the correct stress. Hence his pronunciation is considered to be intelligible, and it is suitable enough to be used for NNS's intelligibility analysis.

Figure 5.22: Learner's Intelligibility Analysis for the Word "compose"

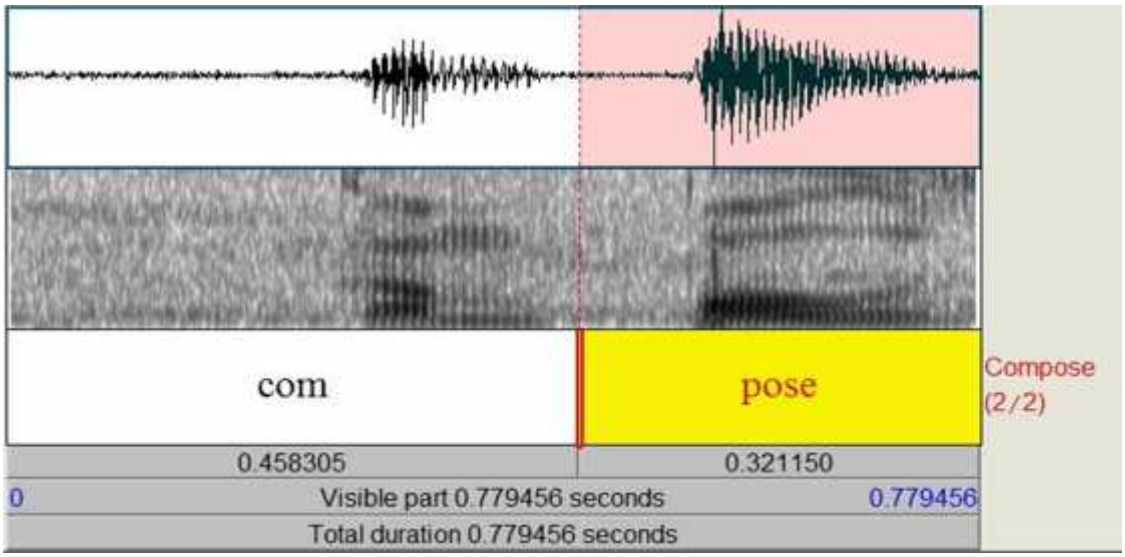


Figure 5.22 shows the non-native speaker's digital voice analysis for the word "compose". As per analysis provided in above figure we can observe that the waveforms on the area of the second syllable are longer and have more density than the other syllable. Besides, the spectrogram analysis also shows more intensity of voice on the second syllable (*"pose"*), so we can conclude that the learner correctly pronounced the word with correct stress. This word contains two syllables and according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the correct primary stress is fallen on the second syllable (*"pose"*) as there is a visible density on waveforms and intensity on spectrogram analysis on this syllable which in result makes it recognizable from other syllables. Hence the learner pronounced the word intelligibly with correct stress.

Although the learner pronounced the word intelligibly, but there is a significant difference in the length and height of waveforms analysis between the native speaker's pronunciation and the learner's. The waveforms in native speaker's pronunciation are longer and closer to the waveforms of the other syllable whereas, in learner's pronunciation the waveforms are shorter in height and length and the distance between the waveforms of two syllables makes the analysis process a bit challenging compared to the native one.

Figure 5.23: Native Speaker's Intelligibility Analysis for the Word "altitude"

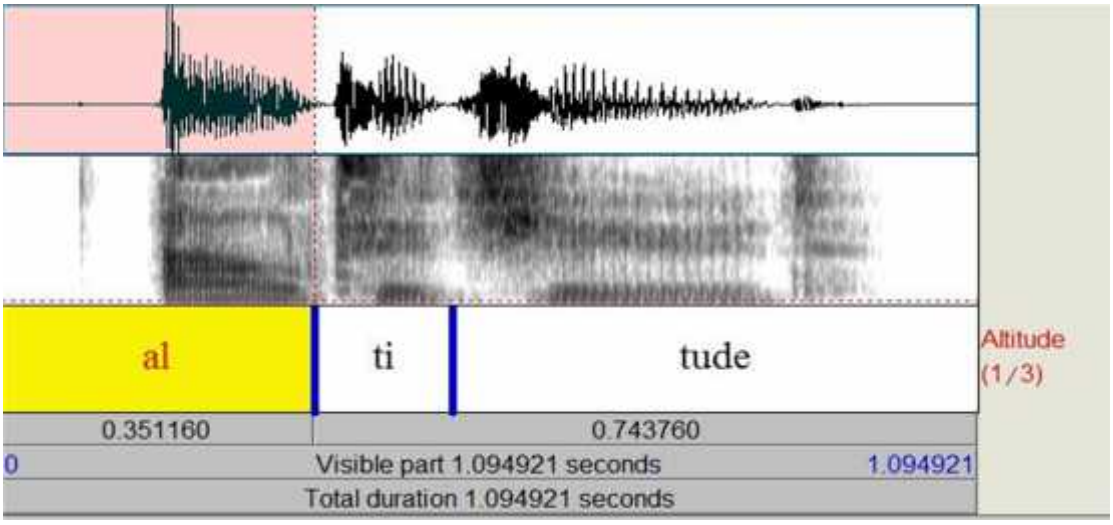


Figure 5.23 shows the native speaker's voice analysis for the word "altitude". As per the analysis provided in this figure we can observe that this word contains

three syllables, and according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the correct primary stress is fallen on the first syllable (“al”) as there are a visible higher waves on waveforms on the area of this syllable. By looking at the spectrogram analysis, we can see a slight extra intensity in the area of the first syllable.

According to different stress, pattern explained in the previous chapter explained in the previous chapter, the native speaker in this figure pronounced the word intelligibly. Hence his voice analysis sample can be used for learner’s intelligibility evaluation for the same word.

Figure 5.24: Learner’s Intelligibility Analysis for the Word “altitude”

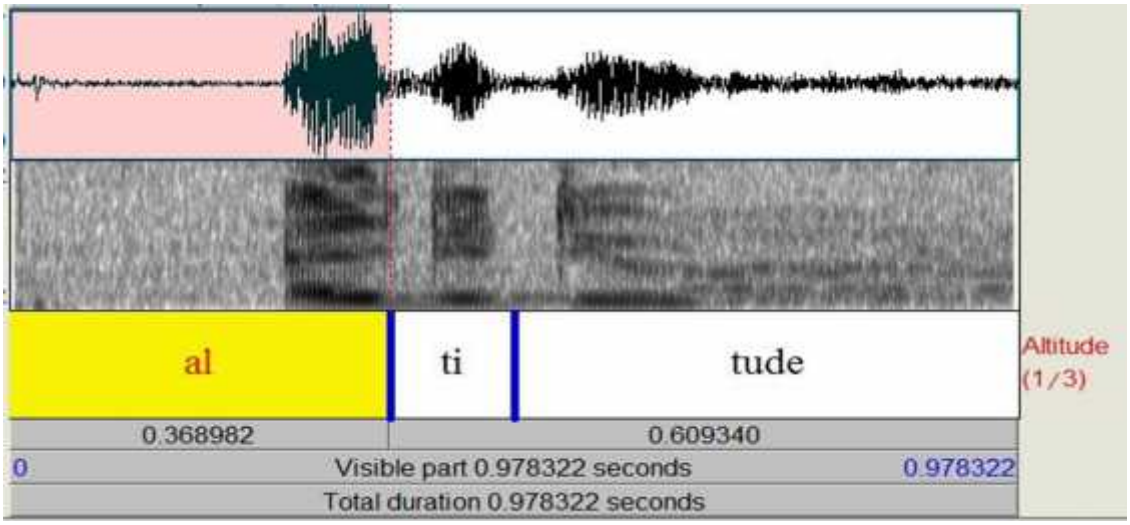


Figure 5.24 shows the Non-native Speaker’s(NNS) or learner’s voice analysis for the word “altitude” for the intelligibility purpose. As per the analysis provided in above figure we can observe that the waveforms on the area of the first syllable are longer and have more density than the other syllables. Besides, the spectrogram analysis also shows a visible voice intensity on the location of first syllable (‘*al*”).

By comparing this figure with Figure 5.23 where the same word is pronounced by the native speaker, we can conclude that the learner correctly and accurately pronounced the word with correct stressed syllable (“al”). The intelligibility analysis of Figure 5.24 shows that like the native speaker, the learner, or NNS also accurately and correctly put the stress on the first syllable.

Hence the NNS here had uttered an intelligible pronunciation for this word.

Figure 5.25: Native Speaker's Intelligibility Analysis for the Word "conceptual"

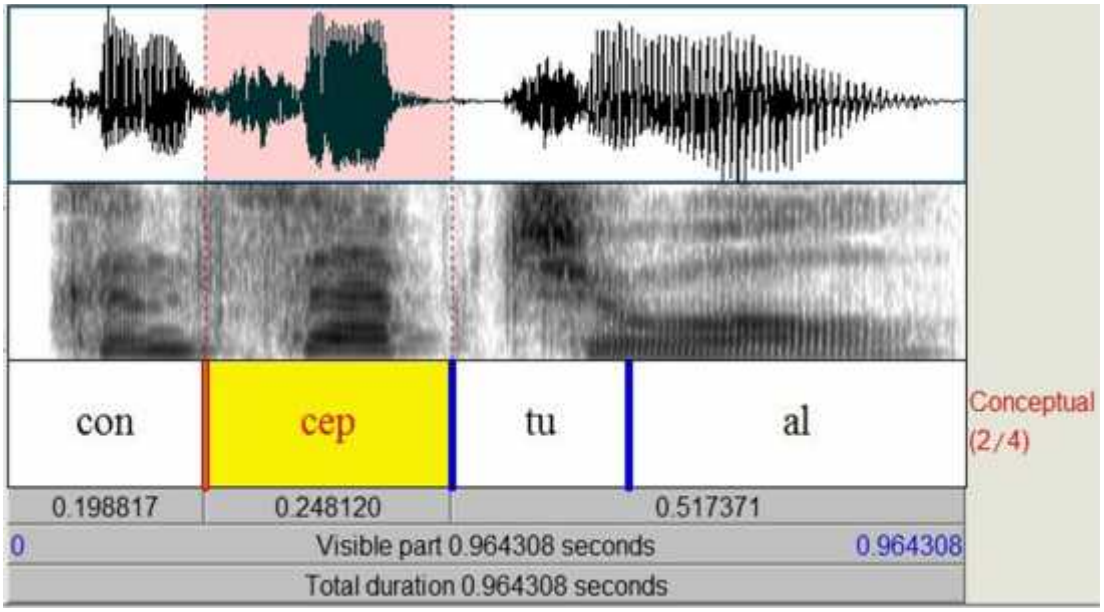


Figure 5.25 shows the native speaker's voice analysis for the word "conceptual". As per the analysis provided in this figure we can observe that this word contains four syllables, and according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the correct primary stress is fallen on the second syllable ("*cep*") as there are a visible higher waveforms on the area of this syllable. By looking at spectrogram analysis also we can see a clear extra intensity in the area of second syllable which all show that the NS's pronunciation is intelligible enough to be used for learner's intelligibility analysis and evaluation.

Figure 5.26: Learner's Intelligibility Analysis for the Word "conceptual"

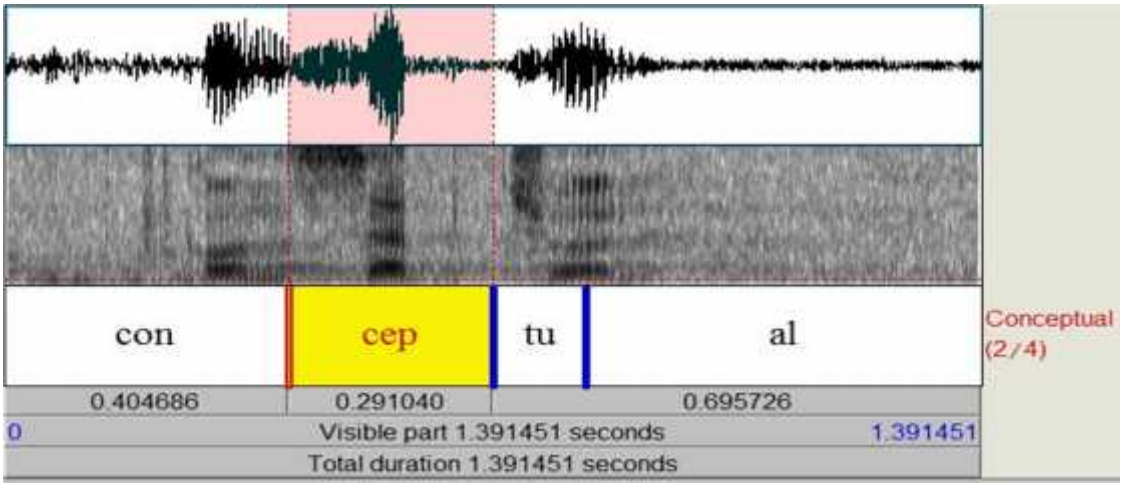


Figure 5.26 depicts the non-native speaker's voice analysis for the word "conceptual". The analysis provided in this figure shows that the waveforms on the

area of second syllable(“cep”) are longer and there is more density of waves on it compared to other syllables. Furthermore, the spectrogram analysis of the figure slightly shows more voice intensity on the location of second syllable *(“cep”).*

By comparing this figure with Figure 5.25 where the same word is pronounced by the NS, we can conclude that the learner successfully managed to give the second syllable more stress than the other syllable.

Hence we consider NNS’s pronunciation as an intelligible one although both the figures accurately show the stressed syllable but, the digital analysis in Figure 5.25 shows that the waveforms are longer and higher and the intensity of voice in spectrogram section is visibly stronger than the learner’s one.

Figure 5.27: Native Speaker’s Intelligibility Analysis for the Word “footprint”

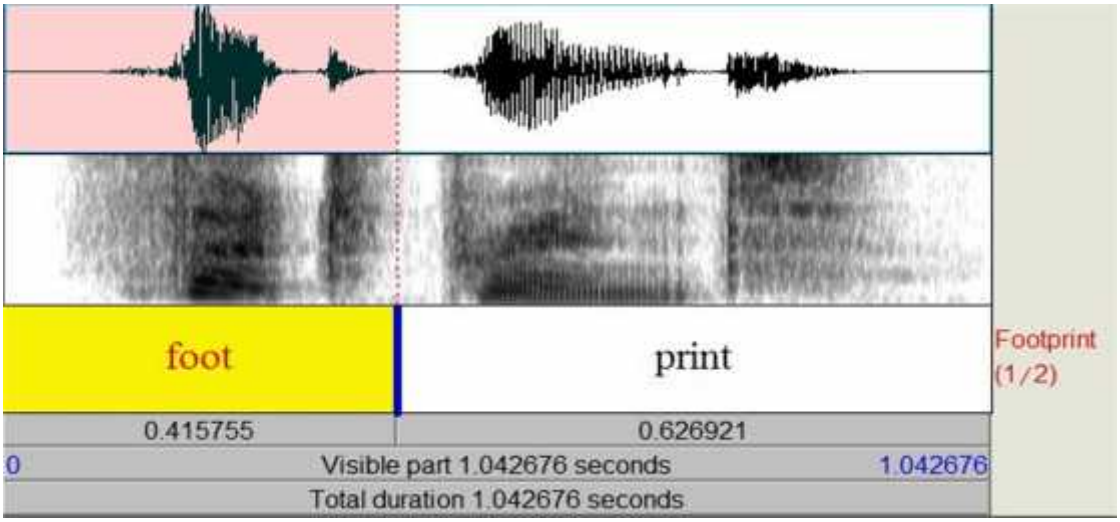


Figure 5.27 shows the native speaker’s voice analysis for the word “footprint”. As per the analysis provided in this figure we can observe that this word contains two syllables and according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the correct primary stress is fallen on the first syllable (“foot”) as there are a visible higher waveforms on the area of this syllable and the density of waveforms on the first syllable is considerably more than the other syllable. By looking at spectrogram analysis, we can see a clear extra intensity in the area of the first syllable.

Hence the NS’s pronunciation is significantly intelligible and can be used for learners’ intelligibility analysis.

Figure 5.28: Learner's Intelligibility Analysis for the Word "footprint"

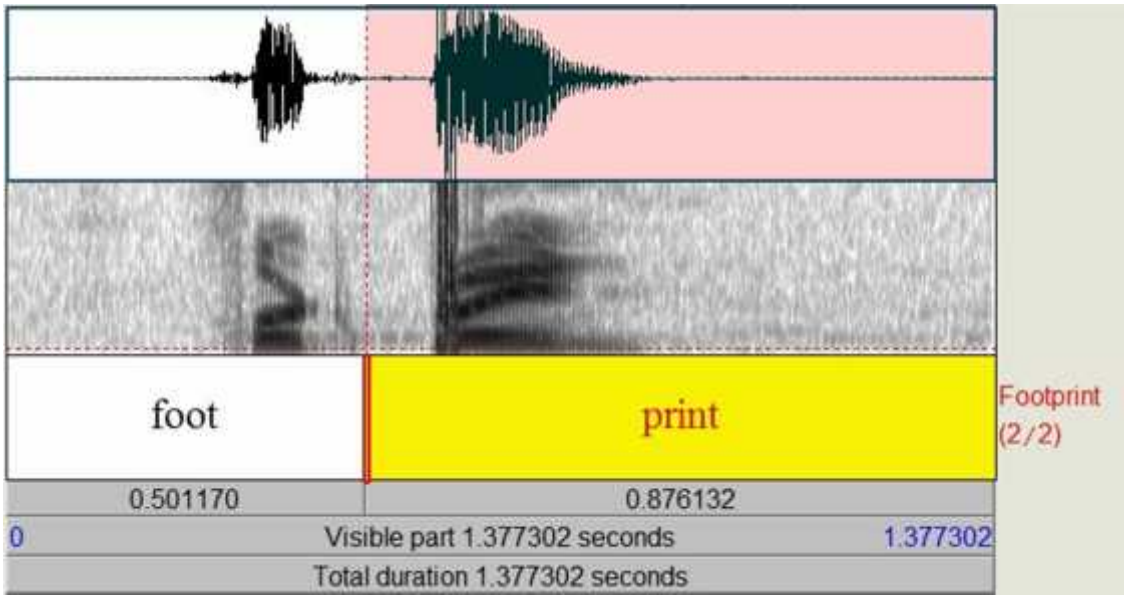


Figure 5.28 shows the digital analysis of Learner 7's voice. As it is shown in this figure, the learner didn't quite do well in the pronunciation of the word "footprint". With a close and analytical look at the digital voice analysis of Learner 7, we notice that the density of waveforms in his voice is more on the second syllable ("*prin*t") instead of the first syllable. Even by observing the spectrogram analysis section we notice that there is more intensity of voice on the second syllable instead of the first syllable which indicates that the learner failed to pronounce the word with correct stress and he mistakenly put the stress on the second syllable. Hence his pronunciation is considered as an intelligible utterance.

While comparing Figure 5.28 to Figure 5.27 where the same word is pronounced by the native speaker with proper stress, we understand that in Figure 5.27, the length of waveforms is shorter.

Figure 5.29: Native Speaker's Intelligibility Analysis for the Word "individual"

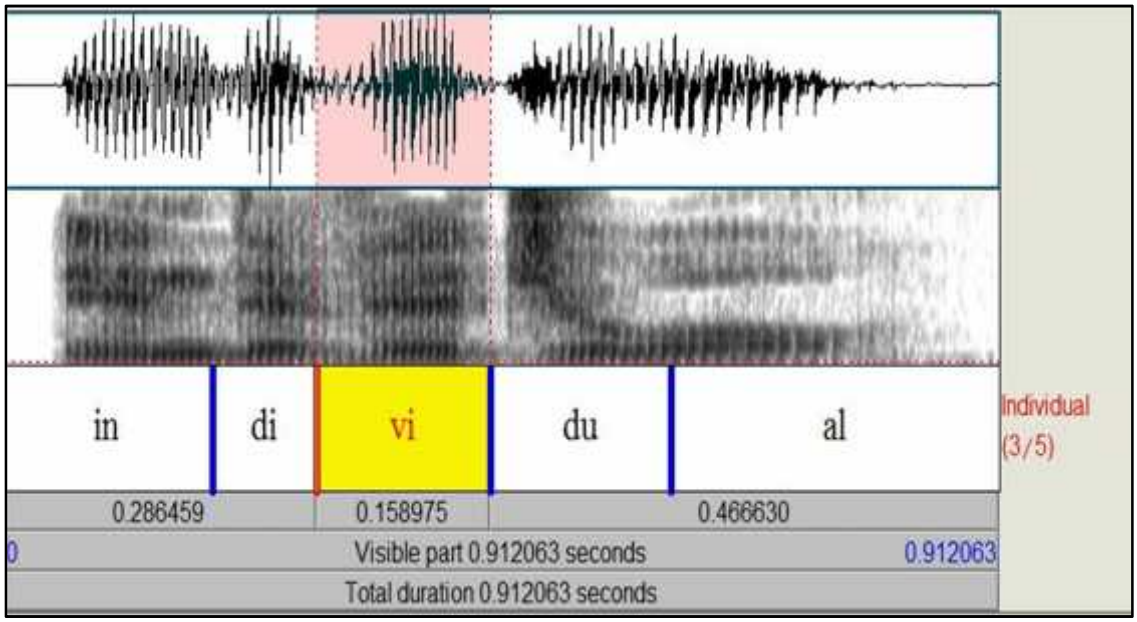


Figure 5.29 shows the native speaker's digital voice analysis for the word "individual". As per the analysis provided in this figure we can observe that this word contains five syllables and according to the stress patterns explained in the previous chapter, the stressed syllable is "*vi*", but according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, we understand that it is difficult to identify the correct primary stressed syllable with Praat software, as there is no significant difference in the length and height of waveforms that is drawn by the software in this analysis. The only identifiable difference that can be visible is that there is slightly more intensity of voice on the place of the third syllable(*/vi/*).As it was explained, it is difficult to find a stressed syllable that could stand distinct from other syllables. However, if we listen to the native speaker's pronunciation we can figure out that the /*vi*/ syllable gets the stress on it, but the software couldn't accurately identify the stressed syllable.

Since the Praat software couldn't provide an analyzable intelligibility sample, we listened to NS's audio clip for evaluating learners' intelligibility for this word.

Figure 5.30: Learner's Intelligibility Analysis for the Word "individual"

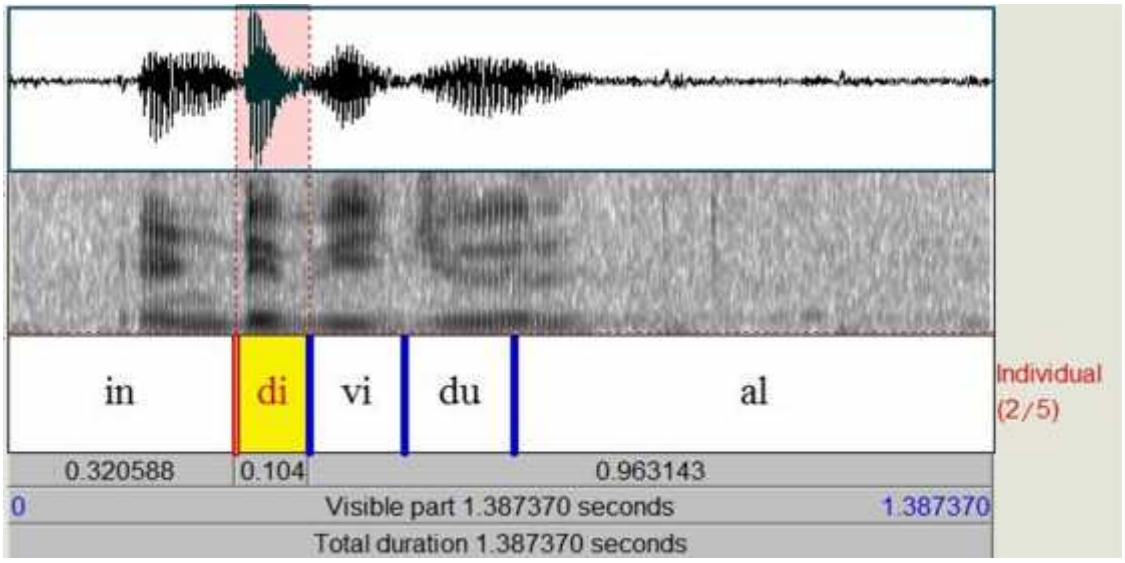


Figure 5.30 shows the digital analysis of Learner 7's voice for the word "individual". As it is shown in this figure, the learner couldn't pronounce the word "individual" correctly. With a close and analytical look at the digital voice analysis of Learner 7, we notice that the density of waveforms in his voice is more on the second syllable ("di"). Even by observing the spectrogram analysis section we can see that there is more intensity of voice on the second syllable rather than third syllable ("vi") which indicates that the learner failed to pronounce the word with correct stress and he mistakenly put the stress on the second syllable.

Even by listening to learner's sound clip and comparing it with native speaker's sound clip we can understand that the learner couldn't intelligibly pronounce the word with correct stress.

Figure 5.31: Native Speaker's Intelligibility Analysis for the Word "present (v)"

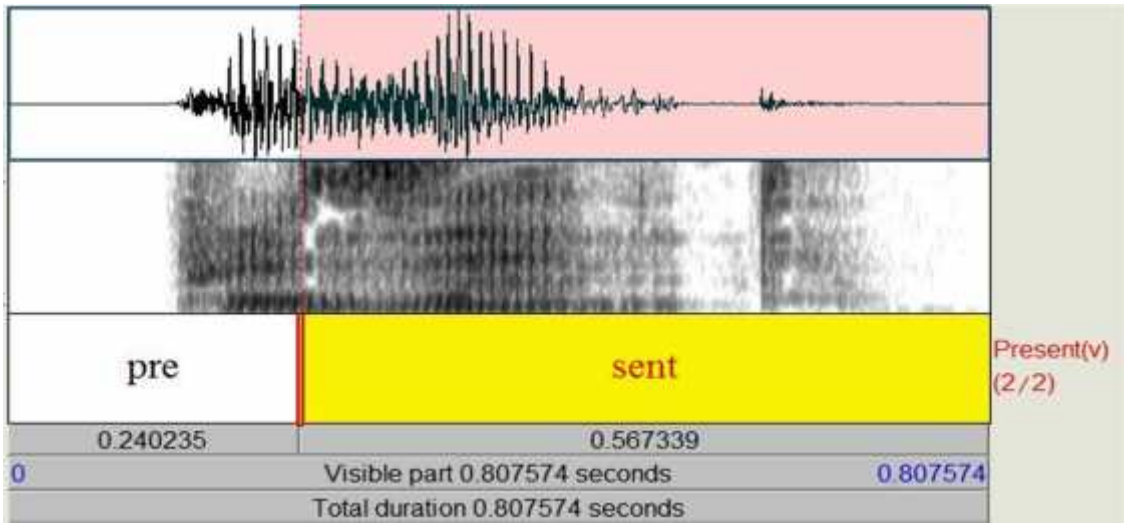


Figure 5.31 shows the native speaker's (NS) voice analysis for the word "present" which the letter "v" next to it signifies that it is pronounced in the form of a verb. As per the analysis provided in this figure we can observe that this word contains two syllables, and according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the correct primary stress is on the second syllable ("*sent*") as there are visible higher and longer waveforms in the area of this syllable. By looking at spectrogram analysis, we can see a clear extra intensity in the area of the second syllable.

Hence the above utterance is intelligible enough to be used for learners' intelligibility analysis and evaluation.

Figure 5.32: Learner's Intelligibility Analysis for the Word "present (v)"

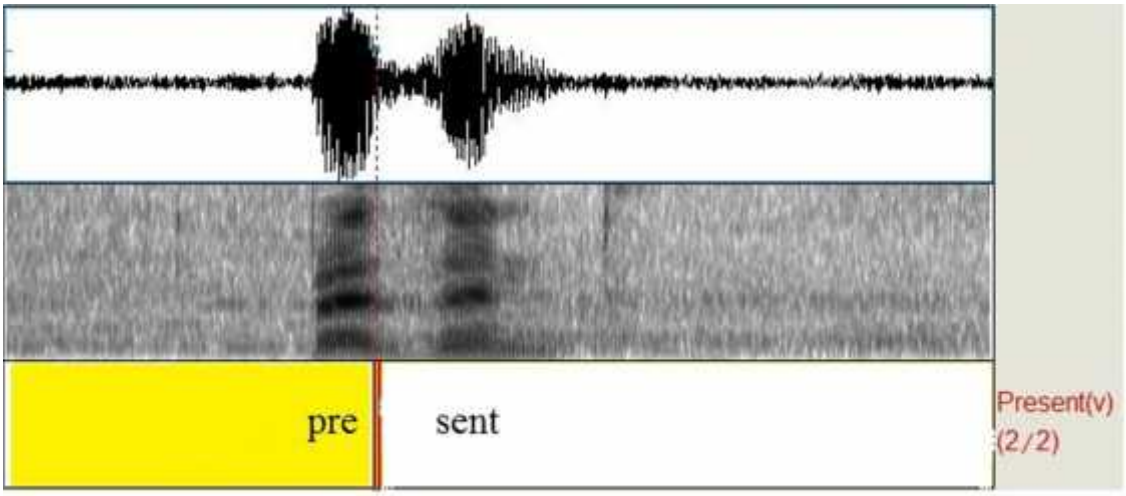


Figure 5.32 shows the digital analysis of Learner 14's voice analysis for the pronunciation of word "present" as a verb. As it is shown in this figure, the learner didn't quite clearly put the stress on the second syllable where the stress has to be put. With a close and analytical look at the digital voice analysis of Learner 14, we notice that waveforms density in his voice is more on the first syllable ("pre") and even by observing the spectrogram analysis section we can recognize that intensity of voice in the first syllable is considerably more. Although by listening to the learner's pronunciation in his sound clip, we hear a slight stress on the second syllable of the word which is not correct.

Hence, by comparing the analysis in this figure with the analysis in the previous figure (Figure 5.31), we conclude that the learner's pronunciation is not intelligible.

Figure 5.33: Native Speaker's Intelligibility Analysis for the Word "surprising"

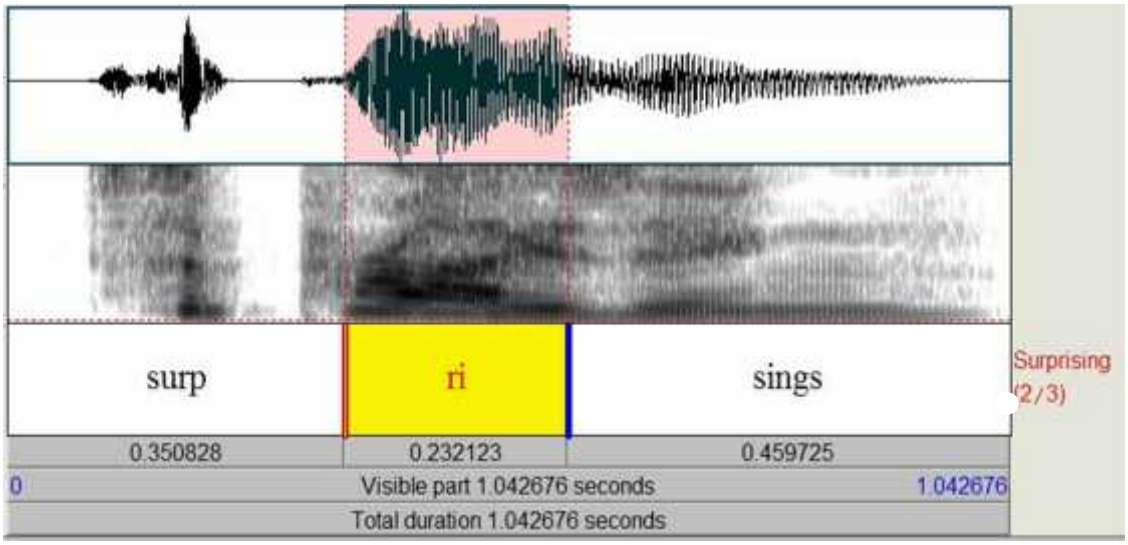


Figure 5.33 shows the Native Speaker's (NS) voice analysis for the word "surprising." As per the analysis provided in this figure we can observe that this word contains three syllables and according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the correct primary stress is on the second syllable /"*ri*"/ as there is a visible higher and longer waveforms on the area of this syllable. By looking at spectrogram analysis, we can see a clear extra intensity in the area of the second syllable which clearly shows that the stress is on the "*/ri/*" syllable.

Therefore the above analysis shows that the NS's pronunciation is intelligible.

Figure 5.34: Learner's Intelligibility Analysis for the Word "surprising"

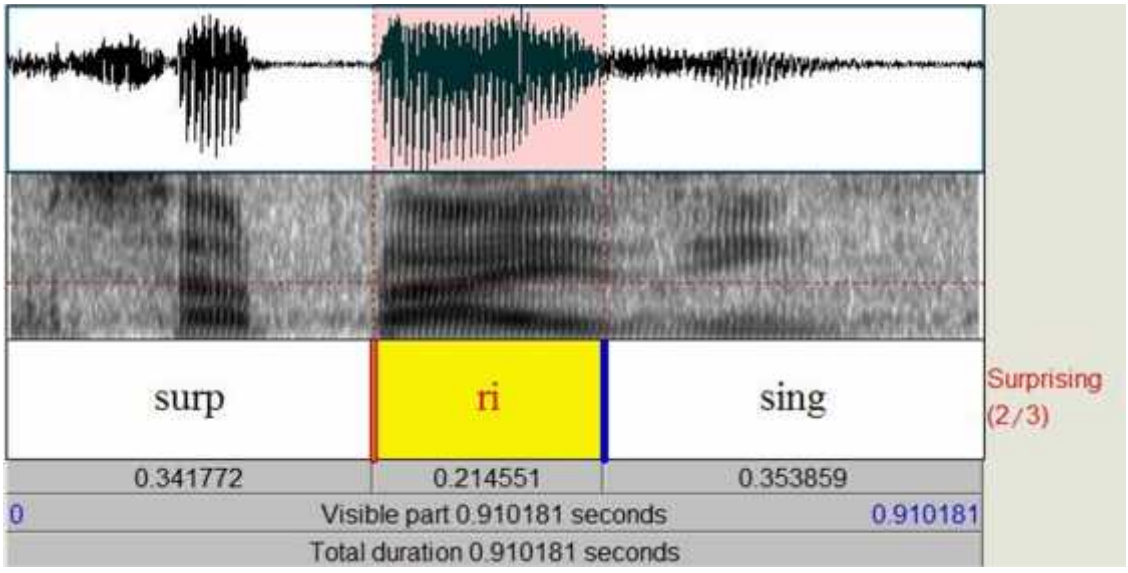


Figure 5.34 depicts the non-native speaker's (Learner 8) voice analysis for the word "surprising". As per the analysis provided in above figure we can observe that the waveforms on the area of second syllable ("*ri*") are longer and there is more density on it compared to other syllables. Furthermore, the spectrogram analysis of the figure visibly shows more intensity on the location of the second syllable.

By comparing this figure with Figure 5.33 where the same word is pronounced by the NS, we can conclude that the learner successfully managed to put the primary stress on the second syllable, but there is still a significant difference in length and heights of sound waves comparing to the native speaker's digital voice analysis shown in Figure 5.33. Although both the Figures 5.33 and 5.34 accurately show the stressed syllable but, the digital analysis in Figure 5.33 shows that the waveforms are stronger in length and height. Moreover, the intensity of voice in spectrogram section shows a stronger voice intensity than the learner's one throughout the utterance.

According to the above analysis, the learner's pronunciation for this word can be rated as an intelligible utterance.

Figure 5.35: Native Speaker's Intelligibility Analysis for the Word "productive"

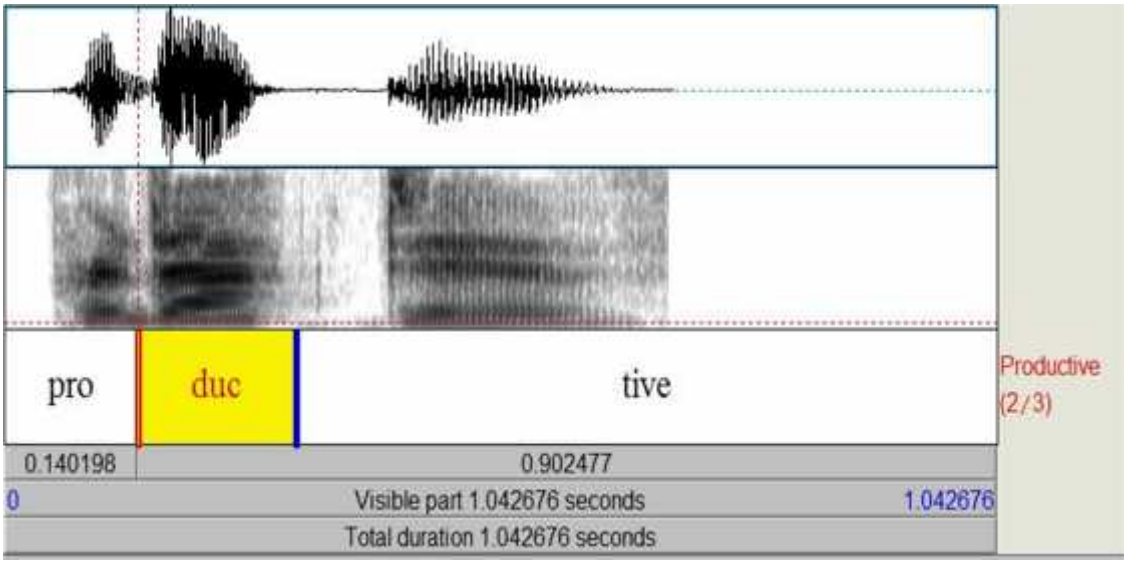


Figure 5.35 shows the Native Speaker's (NS) voice analysis for the word "productive". As per the analysis provided in this figure we can observe that this word contains three syllables and according to the wave density analysis provided on the waveform row and spectrogram analysis on the spectrogram row, it is identifiable that the wave density in the syllable ("*duc*") is more intensive, and the spectrogram

analysis shows a dark color density which means there is more intensity of voice in the area of this syllable. According to the stress patterns explained in the previous chapter and aforementioned analysis, it signifies that this syllable is correctly stressed syllable of the word.

Hence according to the above analysis done by software, NS's pronunciation is intelligible for the software, and it can be used as an ideal sample for learners' intelligibility evaluation.

Figure 5.36: Learner's Intelligibility Analysis for the Word "productive"

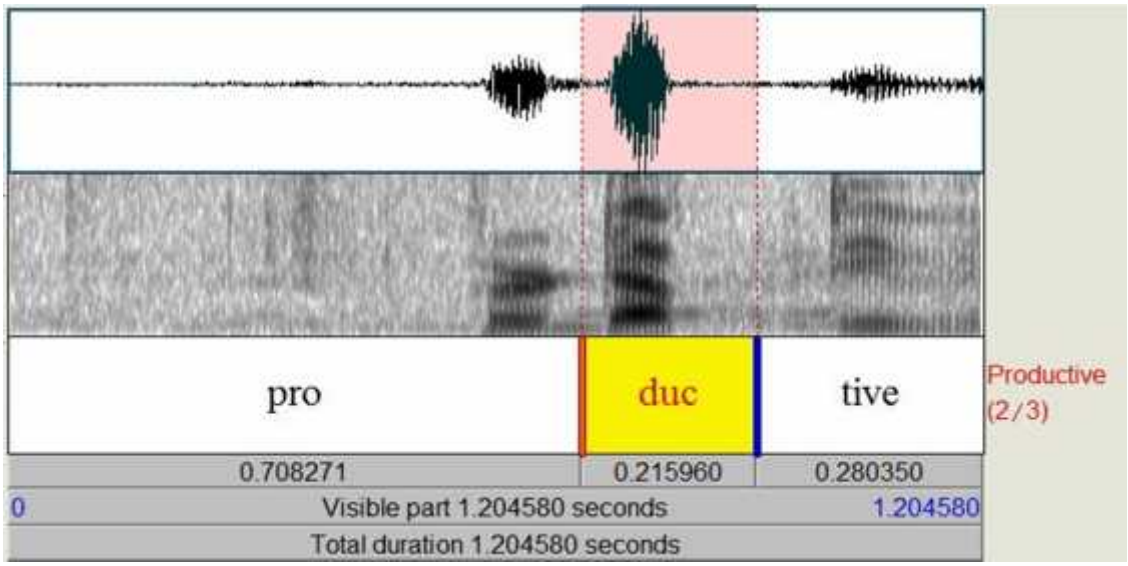


Figure 5.36 depicts the Non-Native Speaker's (NNS) or Learner 8's voice analysis for the word "productive". As per the analysis provided in above figure we can observe that the waveforms on the area of second syllable ("*duc*") are longer and there is more density of waves on this syllable compare to other syllables. Furthermore, the spectrogram analysis of the figure visibly shows more intensity of voice on the location of the second syllable.

By comparing this figure with Figure 5.35 where the same word is pronounced by the native speaker, we can conclude that the learner successfully managed to put the primary stress on the second syllable. Both the figures show similar waveforms and voice intensity throughout the utterance.

Hence we can consider NNS's pronunciation as an intelligible one.

5.7.3. Data Analysis of Phase 4

As it is already mentioned the Phase 4 was about learner's intelligibility test for Post-test2 (word stress). After conducting this phase, then we analyzed learners' obtained score by calculating the number of intelligible utterances of each student. The intelligibility test for Post-test1 was done after the application of CALL method. The aim of the intelligibility test for Post-test1 is to evaluate the efficiency of CALL method on learners' skills about word stress.

Data analysis of Post-test1 can be stated in the form of the following table:

Table 5.4: Scores and Percentage Obtained by Learners in Intelligibility Test for Post-test1

ID	Intelligible Utterances	% of Intelligible Utterances
L1	16	53%
L2	8	27%
L3	18	60%
L4	9	30%
L5	21	70%
L6	13	43%
L7	20	67%
L8	12	40%
L9	15	50%
L10	12	40%
L11	13	43%
L12	20	67%
L13	19	63%
L14	16	53%
L15	17	57%
Total Questions:	30	

In the intelligibility test for Post-test1, 15 learners were examined that were named from L1 to L15 where the letter "L" stands for "Learner." Every learner's pronunciation was examined, analyzed and evaluated by Praat software in the same way that it was demonstrated in previous figures. Since there were 30 questions in Post-test1, hence in this test 30 digital voice analysis were done for each learner for the purpose of intelligibility evaluation and scoring.

The above table (Table 5.4) shows every learner's obtained score or number of correct answers (intelligible utterances) along with the correct answer percentage of

each learner. After analyzing the data provided in Table 5.4, we found that average score obtained by the student is 15.2 intelligible pronunciation (correct syllable stress) out of 30 questions and intelligible pronunciation percentage of total number of students is 51%. We also found that 60% (9 learners) of the learner scored at least 50% of correct answers which shows 34% improvement compared to the same score obtained by the same learners in Pre-test1.

Chapter - 6

Analysis of Collected Data for the Related Tests on Sentence Intonation

CHAPTER 6

ANALYSIS OF COLLECTED DATA FOR RELATED TESTS ON SENTENCE INTONATION

In this chapter, it is tried to produce an explicit analysis for sentence intonation according to different pre-tests and post-tests in the form of normal tests on paper and intelligibility tests using computer device.

With reference to Chapter Five, Section 5.1 and 5.2 in which the participants and procedure of data collection are mentioned, the collection and analysis of data regarding the sentence intonation-related tests will start from Phase 5 and ends in Phase 8.

Therefore, the data collection and analysis for sentence intonation-related tests can be stated as follows:

6.1. Phase 5: Conducting Pre-test2 (Sentence Intonation)

In this phase, a set of 30 questions in the form of *Pre-test2* (Appendix3) were distributed among each of 15 learners (1 set of the same questions for each learner). The questions in this test were designed to measure the learners' capability in identifying intonation of different types of sentences. This test was conducted prior to any teaching Method. The target tone in this test were: rising tone, falling tone and a mix of tones in a multi-sentences statement. Before conducting Pre-test1, no teaching activity or method was applied to the students. The duration of the test was 20min.

6.1.1. The Structure of Pre-test2

Pre-test2 consists of 30 questions. Every question contains a statement which may contain one or two sentences. The learners must recognize the tone of the sentence according to the type of the sentences which is explained in the parentheses next to every statement. The learners then had to choose the correct intonation of each sentence by tick marking in the boxes below the sentences that provide the option of choosing the proper tone. In order to collect accurate data, the learner must tick mark the proper tone according to his knowledge only and prior to any teaching activity by the researcher. They were not allowed to seek help from the researcher or other learners.

The researcher in this test tried to choose several different types of sentences in order to provide the most common patterns of sentence intonation which are of several types such as falling tone, rising tone and single/consecutive rising tone followed by a falling tone

The sentences were chosen from the following types:

- Ordinary or definite sentences
- Question (Wh question types)
- Question(Yes/no questions type)
- Question(Question tags)
- Question (Implicational type)
- Questions (Ordinary type)
- Question(special type)
- Question (Non-polarity type)
- Question(expecting positive response)
- Question (expecting either positive or negative response)
- Question(alternative)
- Enumerating sentence
- Exclamation
- Command
- Introductory phrase

For the following test, the researcher chose 7 sentences which are pronounced with falling tone, 12 sentences pronounced with rising tone and 12 sentences that are pronounced with single/consecutive rising tone followed by a falling tone

6.1.2. Data Analysis of Phase 5

Data analysis of Phase 5 can be stated as follows:

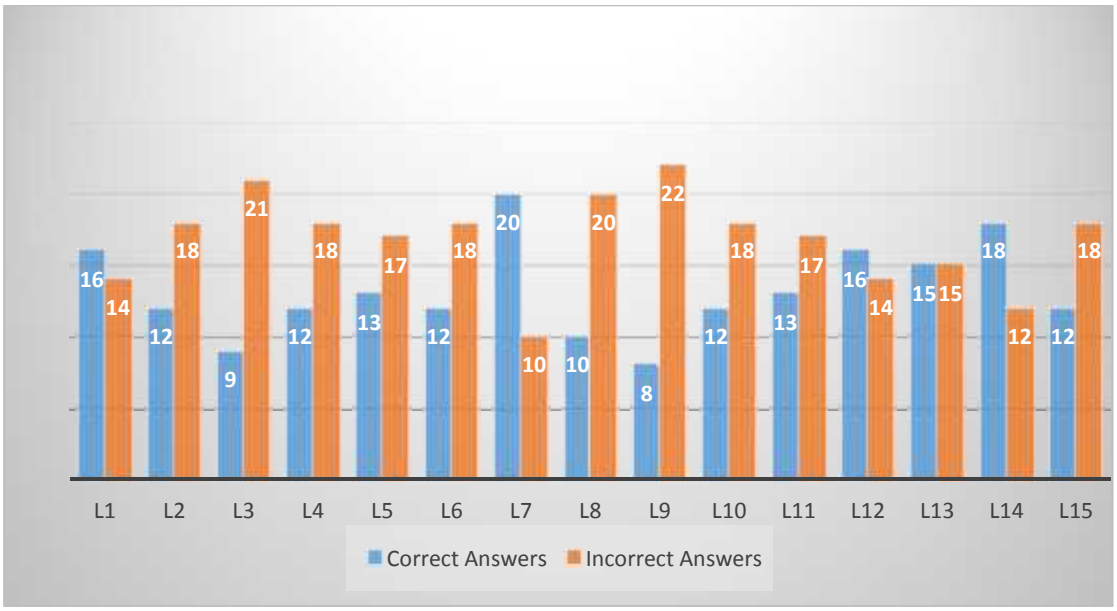
In Pre-test2, 15 learners were examined that were named from L1 to L15 where the letter “L” stands for “Learner”. Table 6.1 shows every learner’s obtained score (number of correct answers) along with the correct answer percentage of each learner. After analyzing the data provided in Table 6.1, we found that average score of correct answers obtained by the student is 13.2 out of 30 questions and correct answers percentage of total number of students is 44%.We also found that 33% (5 learners) of the learners scored at least 50% of correct answers.

Table 6.1 Score and Percentage Analysis Obtained by Learners in Pre-test2

ID	Correct Answers	% of Correct Answers
L1	16	53%
L2	12	40%
L3	9	30%
L4	12	40%
L5	13	43%
L6	12	40%
L7	20	67%
L8	10	33%
L9	8	27%
L10	12	40%
L11	13	43%
L12	16	53%
L13	15	50%
L14	18	60%
L15	12	40%
Total Questions:	30	

The chart in Figure 6.1 also demonstrates a comparison between correct answers and wrong answers given by each learner (L1 to L15) by relatively showing the number of correct and wrong answers on top of each bar for each learner.

Figure 6.1: Comparison of Learner's Correct and Incorrect Answers in Pre-test2



6.2. Phase 6: Learners' Intelligibility Test for Pre-test2

After conducting and completing Pre-test2 by the researcher and learners, in this phase, the researcher asked every learner to read out the sentences with the same tone that they chose to be correct in their Pre-test2. The researcher then started to collect voice samples of the learners by recording every learner's voice for the pronunciation of each word for further intelligibility analysis with Praat voice analyzer software.

6.2.1. Voice Analysis of Pre-test2 for Intelligibility Evaluation of Learners

For analyzing the intelligibility of learners' voice samples, the researcher needed to compare their voice samples with a native speakers' one as an intelligible utterance. The procedure started by demonstrating the graphical voice analysis of each word pronounced by a native speaker with the help of Praat software. Since there was no access to a native speaker in Aligarh Muslim University at the time of data collection, hence the researcher used an internet-based Text to Speech (TTS) machine which is provided in www.oddcast.com website. This TTS machine provides a clear natural human voice for the pronunciation of words or sentences with proper stress and intonation. It is also capable of pronouncing words and sentences in different native English accents such as British, American, Australian, etc. The researcher used American English accent for his pronunciation sample with the help of Praat Software. The reason why the researcher chose the American English accent is because American speakers are considered as one of the most popular native English speakers in the world hence their accent would be the most popular accent as well.

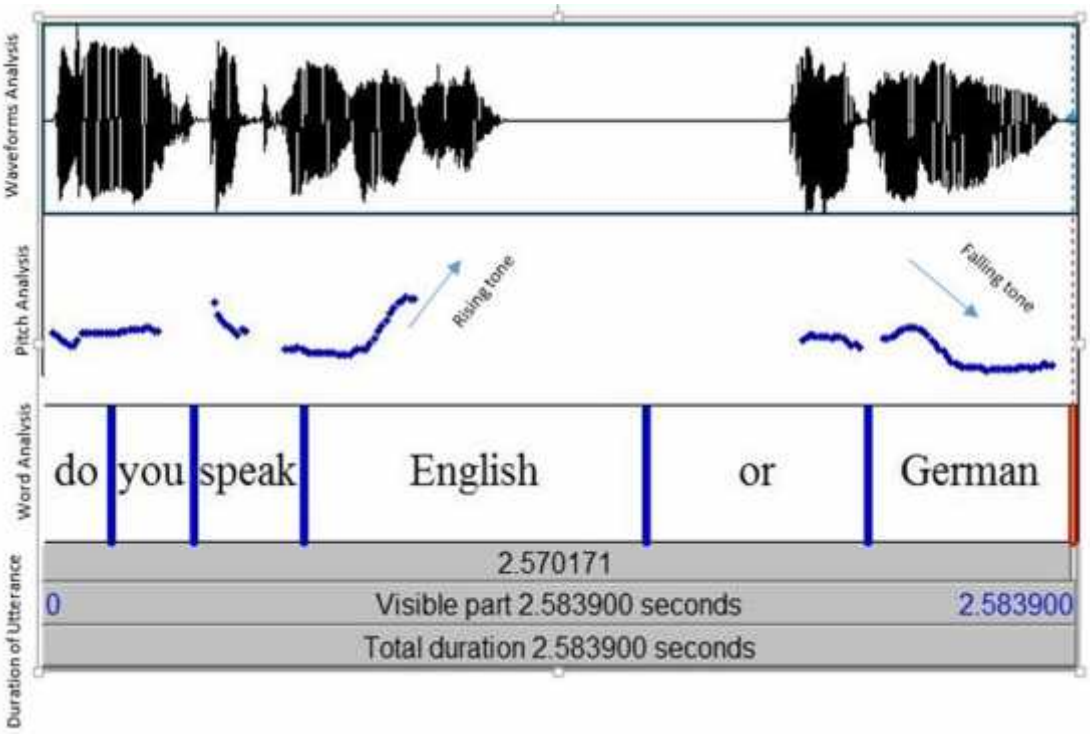
In order to evaluate or assess the intelligibility of learners' utterances, in this section, the researcher made a computerized comparison of voice sample uttered by native speaker and learners. Then he calculated the average accuracy of learners in pronouncing with proper sentence tone. Due to the limitation of pages of this chapter and for the sake of saving paper the researcher mentioned the intelligibility analysis of eight sentences, and then he chose the voice sample of the same eight sentences from eight random learners. In order to achieve a transparent and clear result, the researcher chose eight sentences with different tone such as rising, falling or single/consecutive rising followed by a falling tone.

The researcher chose the following eight sentences for the sample digital analysis of both the native speaker and learners' voice. The type of each sentence is mentioned in the bracket.

1. Betty lives in London. (statement)
2. Do you visit him often?(yes/no question)
3. It is a beautiful day, isn't it?(question-expecting either positive or negative reply)
4. What is his name?(wh question)
5. How nice of you!(exclamatory sentence)
6. She bought cheese, bread, oranges, and apples.(enumerating sentence)
7. You are moving?(question –expecting positive or negative reply)
8. Close your books.(command sentence)

Before analyzing the intonation of above-mentioned sentences uttered by the native speaker, it is tried to analyze another sentence as an example to get familiar with different parts of a digital voice analysis done by Praat software and how we can find an utterance intelligible with the help of this software

Figure 6.2: Native Speaker's Sample Voice Analysis for Sentence Intonation.



The above figure shows the digital voice analysis for the sentence “Do you speak English or German?”. The sentence is an alternative type of question which has a rising tone at the word “English” and a falling tone at the word “German”.

The digital voice analysis in Figure 6.2 is done through Praat software. The analysis consists of three parts; the first part shows the related waveforms of uttered sentence. The second part which is the most important part in identifying intonation of an utterance shows the pitch of the sound in the sentence. The third part is named word analysis which demonstrates the location of uttered words right under the pitch analysis row and waveform analysis row. Last part shows the visible and total duration of the utterance. The arrows in these figures are drawn manually to effectively show the location of rising tone and falling tone in the pitch analysis section.

6.2.2. Determining Intelligibility of Learners’ Utterances for Sentence Intonation with Praat Software

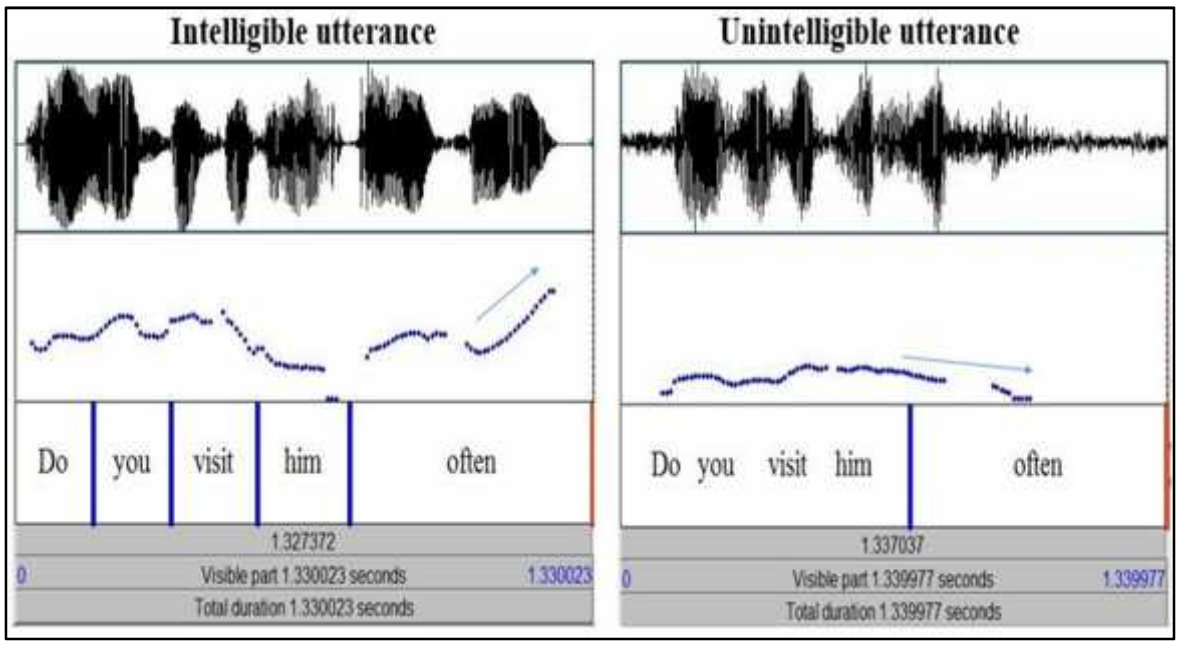
In order to determine the intelligibility of learners’ voice utterance, we had to compare their digital voice analysis with native speaker’s digital voice analysis. As it is already mentioned the digital analysis was done through Praat Software.

The following sample shows the digital analysis and comparison between an intelligible and unintelligible utterance.

In this research, we determined and evaluated the intelligibility of learner’s utterances for sentence intonation by analyzing and then comparing them with the native speaker’s utterances for the same sentence. The whole process of intelligibility analysis of learners’ utterances is done through Praat software.

Figure 6.3 shows the digital analysis and comparison between an intelligible and unintelligible utterance for sentence intonation

Figure 6.3: Intelligibility Analysis of Sentence Intonation Performed by Praat Software



As it is shown in the above figure, the intelligibility of a learner's utterance is determined by comparing its digital analysis with the native speaker's utterance as a trusted and intelligible utterance

This figure shows the digital analysis of Praat software for the sentence "do you visit him often" which is uttered by both the native speaker (left part of the figure) and learner (right part of the figure).

The digital analysis of native speaker's utterance shows that there is a significant rising tone towards the end of the sentence at the pitch analysis section and there are high waveforms at the end of the sentence which shows that the native speaker intelligibly uttered the sentence with correct intonation.

But the digital analysis of learner's utterance shows that there is a flat and even slight falling tone at the pitch analysis section, and there are short waveforms towards the end of the sentence which shows that the learner uttered the sentence with incorrect intonation, hence according to the digital analysis, the learner's voice is considered to be unintelligible.

6.2.3. Analyzing Learners' Intelligibility through Comparison with Native Speaker's Utterance (Pre-test2)

Figure 6.4: Native Speaker's Intelligibility Analysis for Sentence 1

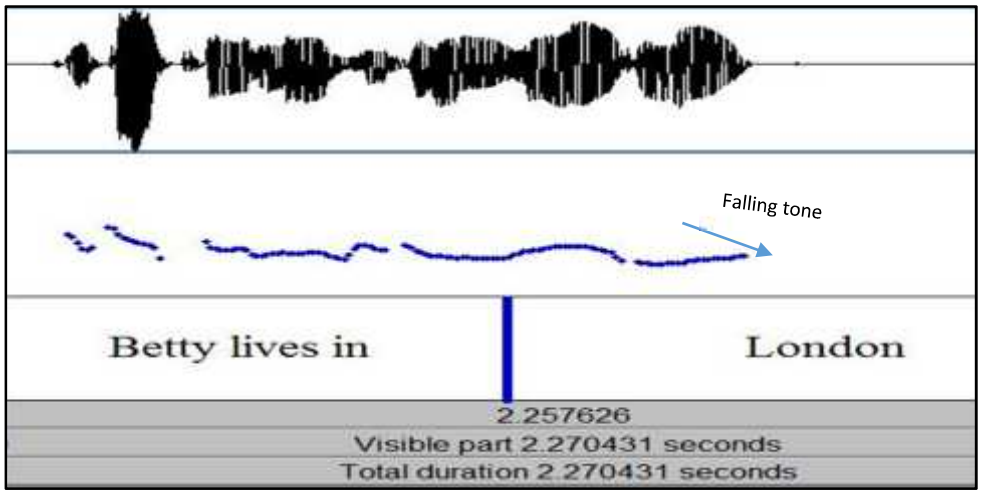


Figure 6.4 shows the native speaker's(NS) voice analysis for the sentence1 "Betty lives in London". The chosen sentence is an ordinary statement, and according to the different intonation patterns explained in the previous chapter, it should end with falling tone. As per the analysis provided in pitch analysis section in this figure, the pitch analysis shows that the sentence ends with a falling tone at the end of it in which an arrow shows the location of falling tone in the pitch analysis section.

Hence the NS's utterance is intelligible and suitable to be used for intelligibility assessment of learners.

Figure 6.5: Learner's Intelligibility Analysis for Sentence 1

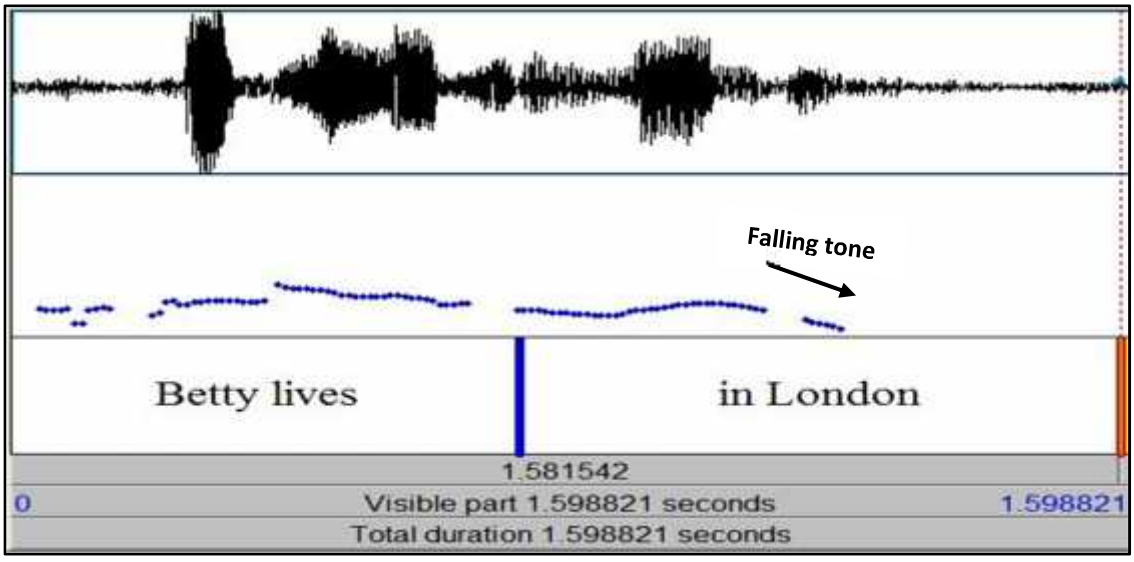


Figure 6.5 shows the learner's voice analysis for the sentence1 "Betty lives in London". As it was explained before, the above-mentioned sentence is an ordinary statement which should end with falling tone. As per the analysis provided in pitch analysis section in this figure, it is visible that the sentence ended with a slight falling tone at the end of which shows that the learner had successfully uttered the sentence with correct tone. Hence learner's utterance is considered to be intelligible.

By comparing the two figures which show the digital voice analysis of the same sentence uttered by a native speaker and the learner, we can find that like the NS the learner or NNS ended the sentence with a suitable and correct falling tone in a similar way that we see in Figure 6.4.

Figure 6.6: Native Speaker's Intelligibility Analysis for Sentence 2"

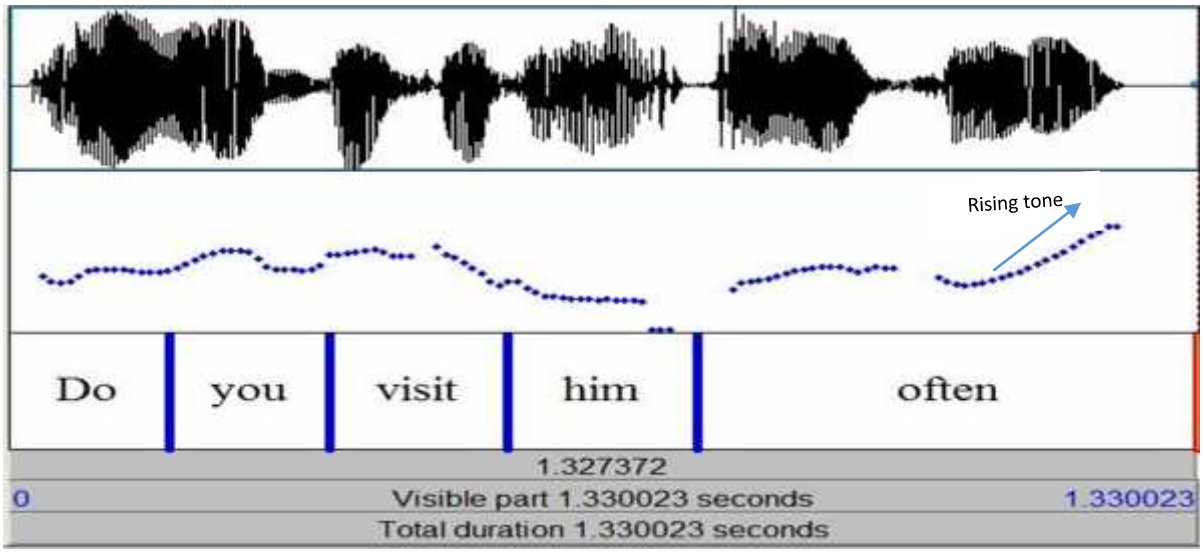


Figure 6.6 shows the native speaker's (NS) voice analysis for the sentence2 "Do you visit him often? ". The chosen sentence is a question type sentence with the possibility of either "yes" or "no" answer in return. According to the different intonation pattern explained in the previous chapter such questions would end with a rising tone.

As per the analysis provided in pitch analysis section in this figure, it is quite visible that the sentence ended with a correct rising tone. The ascending arrow in this figure shows the location of rising tone in the pitch analysis section.

Hence, according to the analysis done by software, the NS made an intelligible utterance which can be used for learner's intelligibility evaluation.

Figure 6.7.: Learner's Intelligibility Analysis for Sentence 2"

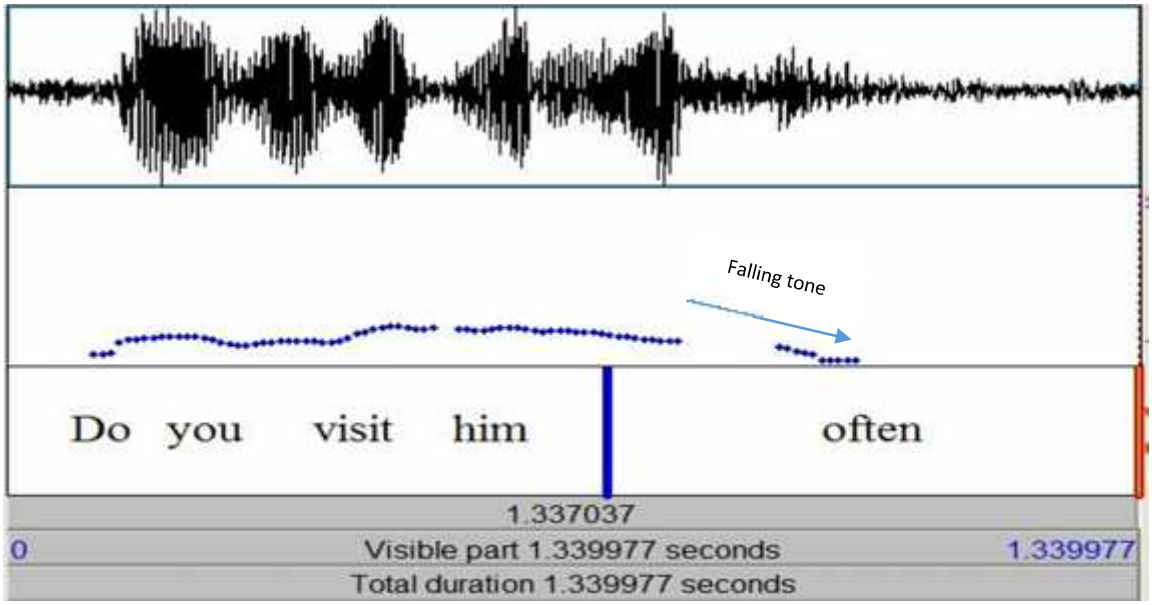


Figure 6.7 shows the learner's voice analysis for the Sentence2 "Do you visit him often". As it was explained in the previous chapter, the sentence is a question type sentence with the possibility of either "yes" or "no" answer in return. Therefore the sentence should end with a rising tone. As per the analysis provided in the pitch analysis section of this figure, it is quite visible that the learner ended the sentence with a slight falling tone instead of rising tone. The descending arrow in this figure shows that the pitch level of the voice slid down towards the end of the sentence. All these analyses show that the learner had failed in uttering the sentence with correct tone and he was not intelligible in uttering the above sentence.

By comparing this figure which shows the digital voice analysis of the learner with the previous figure which shows the digital voice analysis of the same sentence uttered by the native speaker, we can find that the time duration of both the utterances are same, but by looking at the pitch contours in Figure 6.6 we can observe that the native speaker had maintained a good and suitable pitch movement throughout the sentence which adds to the intelligibility of his utterance where the pitch contour analysis in Figure 6.7 shows an almost flat pitch movement throughout the sentence uttered by the learner.

Figure 6.8: Native Speaker's Intelligibility Analysis for Sentence 3

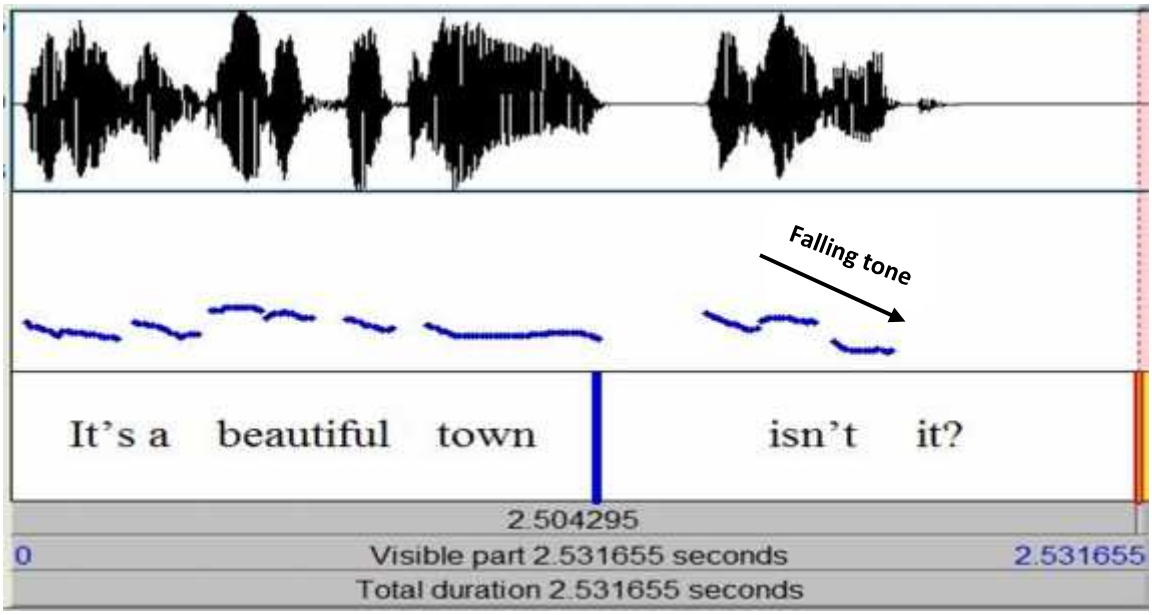


Figure 6.8 shows the native speaker's (NS) voice analysis for the Sentence 3 "It's a beautiful town, isn't it? ". The chosen sentence is a question type sentence in which the speaker expects a positive reply from the listener. According to the different intonation patterns explained in the previous chapter, such questions will follow with a falling tone at the end of them.

As per the analysis provided in pitch analysis section of this figure, it is quite visible that the sentence ended with a visible falling tone. The descending arrow in this figure shows the location of falling tone in the pitch analysis section.

Hence the NS had successfully produced an intelligible utterance for the mentioned sentence.

Figure 6.9: Learner's Intelligibility Analysis for Sentence 3

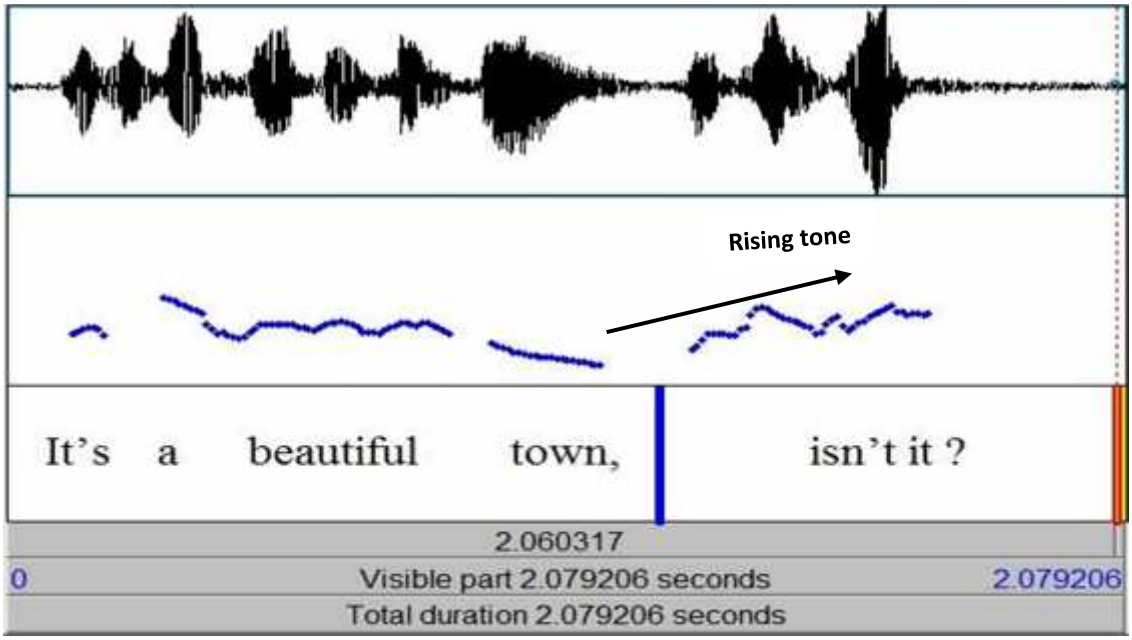


Figure 6.9 shows the learner's voice analysis for the sentence 2 "It's a beautiful town, isn't it?". As it was explained before, the sentence is a question type sentence in which the speaker expects confirmation or positive answer from the listener. As it was explained before, the sentence should end with a falling tone, but as per the analysis provided in pitch analysis section of this figure, it is quite visible that the learner ended the sentence with a rising tone instead of falling tone. The ascending arrow in this figure shows that the pitch level of the voice slid up towards the end of the sentence. The aforesaid analysis shows that the learner had failed in uttering the sentence with correct tone and he reversely finished the sentence with a rising tone in his voice; so he produced an intelligible utterance.

By comparing this figure which shows the digital voice analysis of the learner with the previous figure which shows the digital voice analysis of the same sentence uttered by the native speaker, we can find that in Figure 6.9 pitch contours analysis and waveforms show that the despite the wrong intonation, the learner had maintained an acceptable pitch movement throughout the sentence. After comparing this figure with native speaker's utterance, we found learner's (NNS) utterance unintelligible as it is in conflict with NS's digital analysis in Figure 6.8.

Figure 6.10: Native Speaker's Intelligibility Analysis for Sentence 4

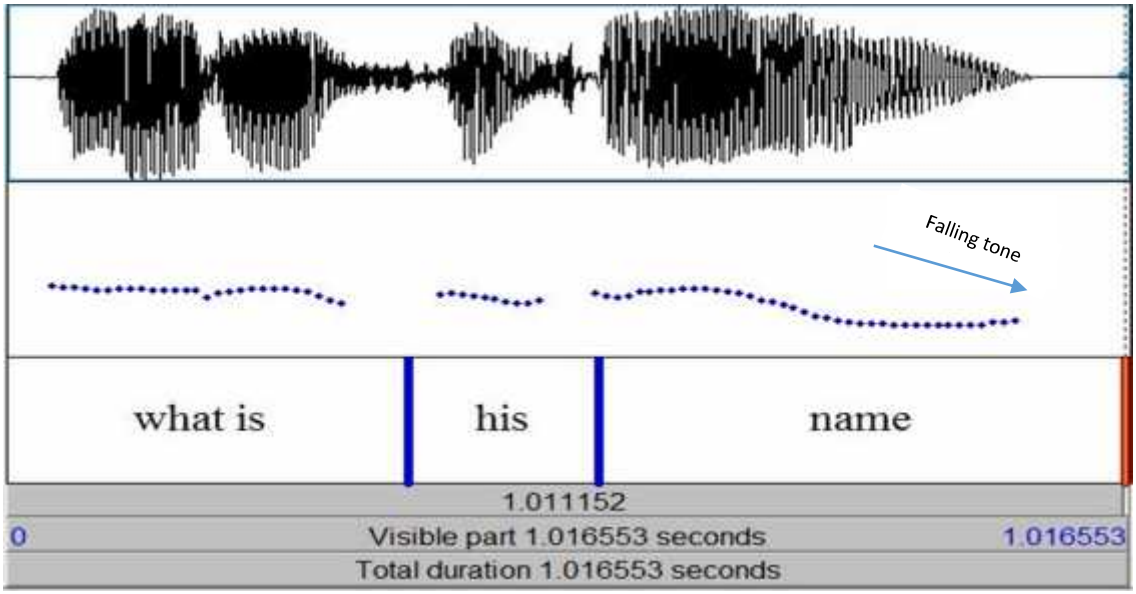


Figure 6.10 shows the Native Speaker's(NS) voice analysis for the sentence 4 "What is his name? ". The chosen sentence is an ordinary "wh" question type sentence in which the speaker expects an ordinary reply from the listener and the listener should give a name of a person as the reply. According to the intonation patterns explained in the previous chapter, such sentence would follow with a falling tone at the end of them.

As per the analysis provided in pitch analysis section of this figure, it is quite visible that the sentence ended with a visible falling tone. The descending arrow in this figure shows the location of rising tone at the pitch analysis section.

Figure 6.11: Learner's Intelligibility Analysis for Sentence 4

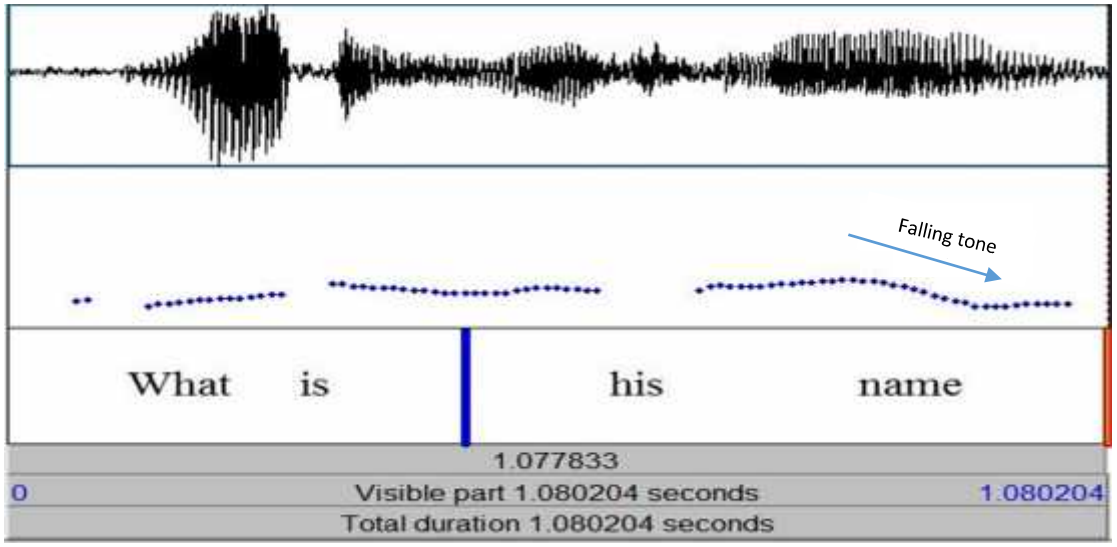


Figure 6.11 shows the learner's voice analysis for the sentence4 "What is his name?". As it was explained before, the above-mentioned sentence is a "wh" type question which should end with a falling tone. As per the analysis provided at pitch analysis section in this figure, it is visible that the sentence ended with a slight falling tone at the end of it which shows that the learner had intelligibly uttered the sentence with correct tone. The descending arrow in the figure shows the location of falling tone.

By comparing Figure 6.11 with Figure 6.10 which shows the digital voice analysis of the same sentence that uttered by the native speaker, we can find that the learner ended the sentence with a suitable and correct falling tone. The pitch analysis and waveforms in the figure show a flat type of intonation throughout the sentence as there are no significant pitch contours in the figure. Therefore it shows that the pitch movement is almost flat throughout the sentence.

Figure 6.12: Native Speaker's Intelligibility Analysis for Sentence 5

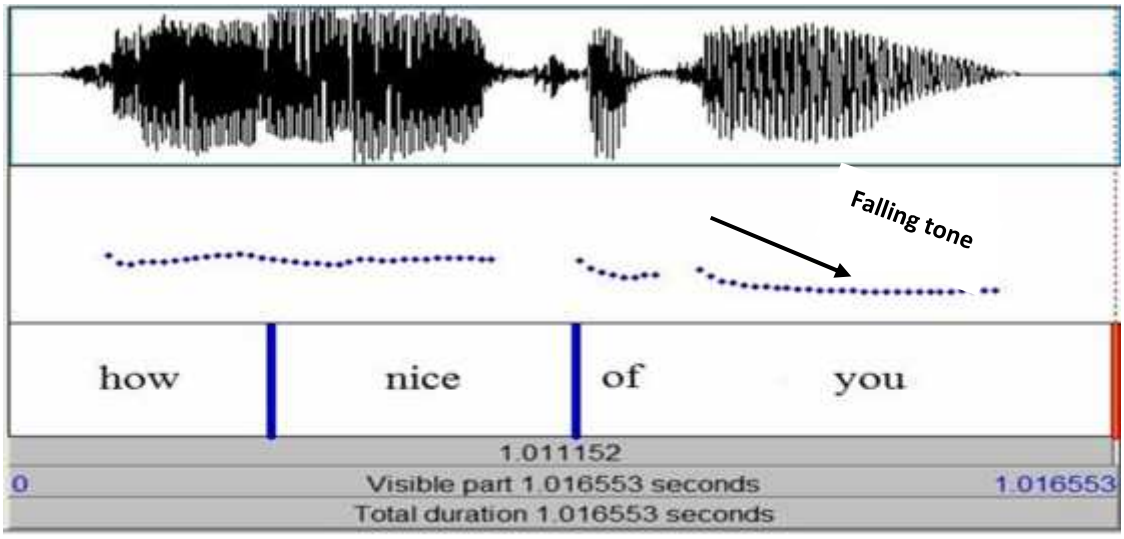


Figure 6.12 shows the native speaker's (NS) voice analysis for the sentence 5 "How nice of you! ". The following sentence is an exclamatory utterance, and according to the intonation patterns explained in the previous chapter, such questions will follow with a falling tone at the end of them.

As per the analysis provided in pitch analysis section of this figure, it is quite visible that the sentence ends with a visible falling tone. The descending arrow in this figure shows the location of falling tone in the pitch analysis section.

According to the above analysis, it shows that the NS had uttered the sentence intelligibly and accurately with correct intonation. Hence his voice sample can be used for learners' intelligibility evaluation and assessment in the same sentence.

Figure 6.13: Learner's Intelligibility Analysis for Sentence 5

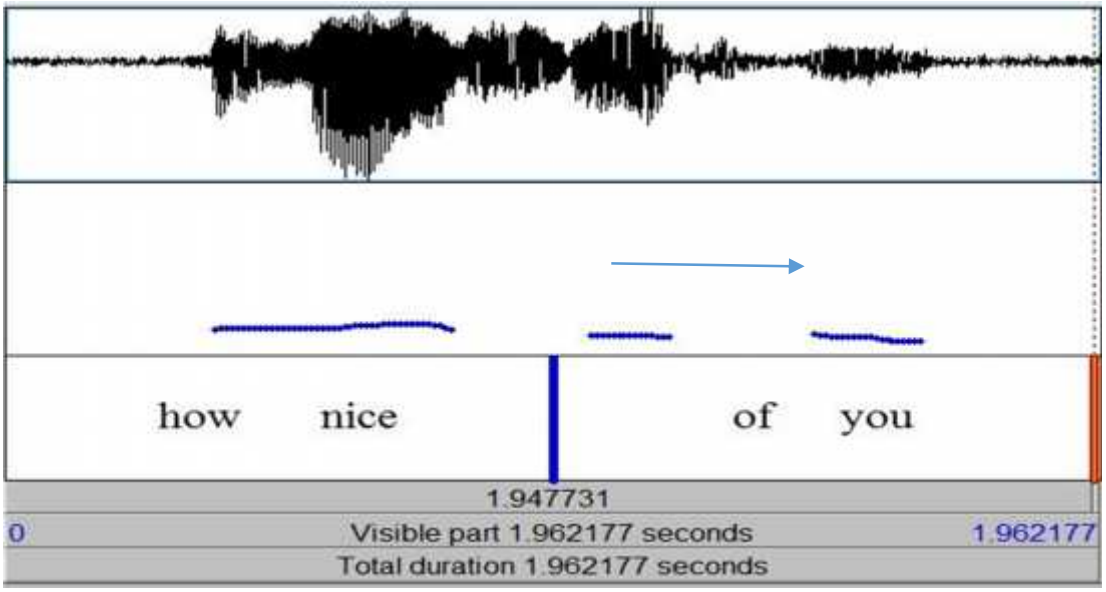


Figure 6.13 shows the learner's digital voice analysis for the sentence 5 "How nice of you!". As it was explained in Chapter Four about the different patterns of sentence intonation , the above-mentioned sentence is an exclamatory type of sentence which should end with a falling tone. As per the analysis provided in the pitch analysis section of this figure, it is visible that the learner uttered the sentence with a flat type of intonation and the pitch movement throughout the sentence also shows that the learner had ended the sentence with a flat tone. Hence the learner's or non-native speaker's (NNS) utterance is considered to be unintelligible.

The pitch analysis and waveforms in the following figure show a flat type of intonation throughout the sentence as there are no significant pitch contours in the figure which shows that the pitch movement is almost flat throughout the sentence.

Figure 6.14: Native Speaker's Intelligibility Analysis for Sentence 6

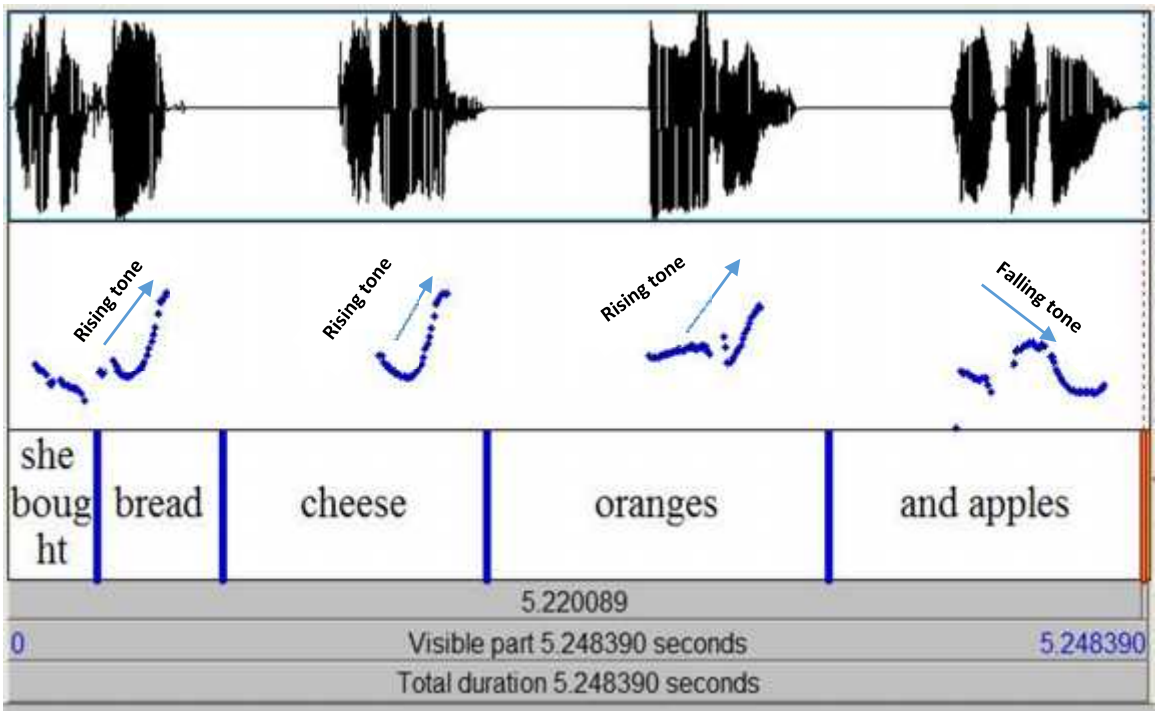


Figure 6.14 shows the native speaker's (NS) voice analysis for the sentence 6 "She bought bread, cheese, oranges, and apples". The following sentence is an enumerating type of utterance. According to the various patterns of intonation which were explained in the previous chapter, in enumerating sentence, all items which are prior to the last item will be followed by a rising tone on each of them and the last item will terminate the sentence with a falling tone.

As per the analysis provided in pitch analysis section of this figure, it is quite visible that except the last item which ended the sentence with a falling tone, other items show a rising tone on their pitch analysis. The arrows in this figure show the location of rising and falling tone of each item in the pitch analysis section. The digital voice analysis in this figure visibly shows that the NS had produced an intelligible utterance which can be used as a sample of intelligible utterance to be used for intelligibility evaluation purpose of learners.

Figure 6.15: Learner's Intelligibility Analysis for Sentence 6

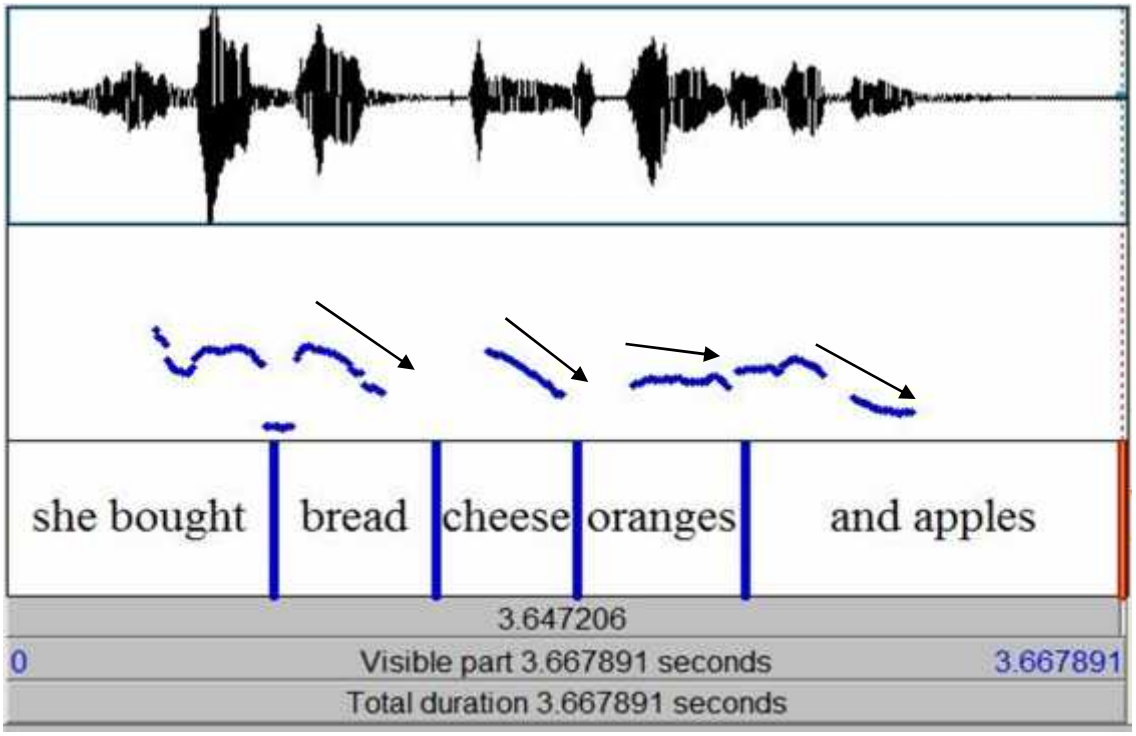


Figure 6.15 shows the learner's voice analysis for the sentence1 "She bought bread, cheese, oranges, and apples.". As it was already explained in the previous figure, the following sentence is an enumerating type of utterance, and in such sentences, all items which are prior to the last item will be followed by a rising tone on each of them and the last item will terminate the sentence with a falling tone.

The analysis provided in pitch analysis section of this figure shows that the learner had terribly failed in uttering the sentence with correct intonation. By analyzing the pitch movement of his voice in this figure, it is visible that the learner put a falling tone on all items (bread, cheese, oranges, and apples) in the sentence where he should have given rising tone to the first three items and falling tone for the last item.

By comparing Figure 6.15 with the previous Figure(6.14) which shows the digital voice analysis of the same sentence uttered by the native speaker, we can find that the learner ended the sentence in the time duration of 3.6 seconds whereas the native speaker spent 5.2 seconds to finish the utterance. This signifies that the learner uttered the sentence faster than the native speaker which can be the reason why he failed in saying the sentence with correct intonation. Comparison of the waveforms in the two figures also shows that in native speaker's utterance, there is a brief silence

zone after each item which helps the speaker to produce correct intonation after each item where the learner failed it.

Hence according to all above analysis, we can conclude that the learner had made an intelligible utterance in this sentence.

Figure 6.16: Native Speaker's Intelligibility Analysis for Sentence 7

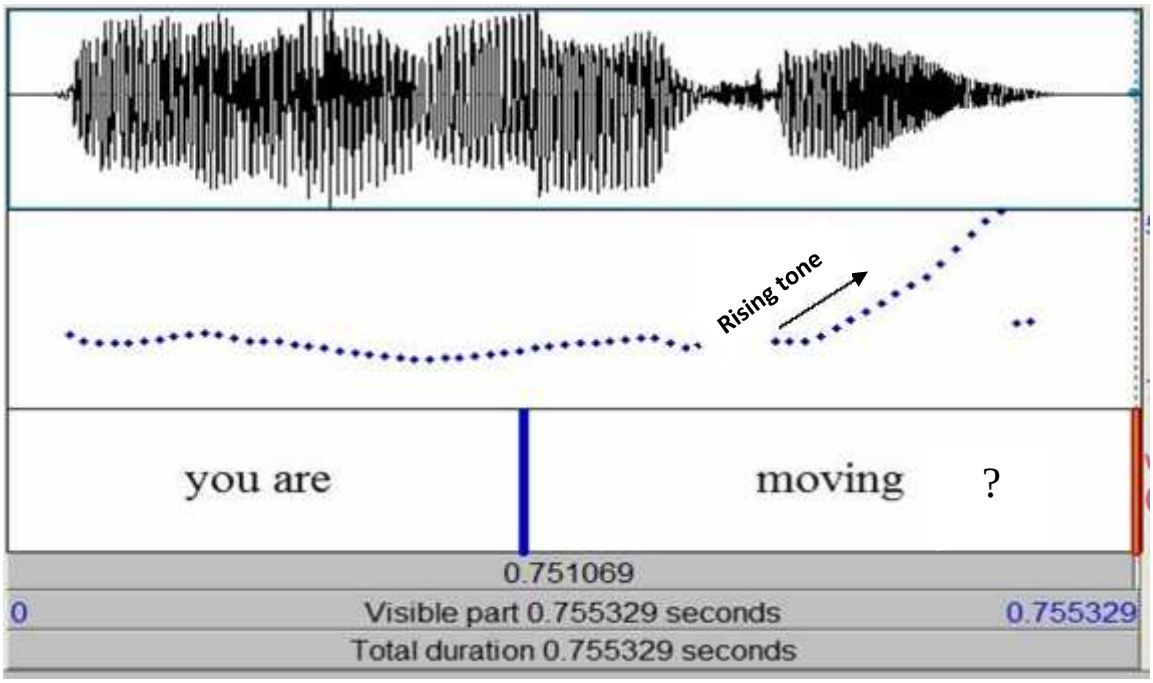
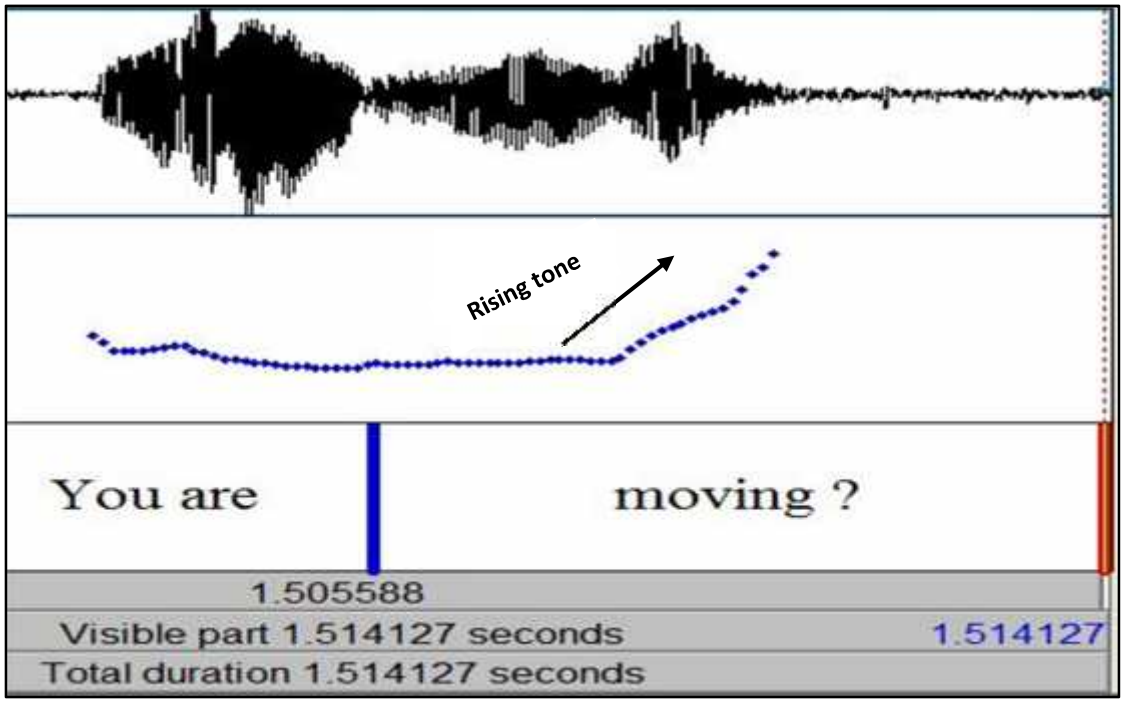


Figure 6.16 shows the native speaker's voice analysis for the sentence 7 "You are moving? ". The chosen sentence is question type sentence but built in the form of a statement structure with the possibility of either "yes" or "no" answer in return. According to the intonation pattern explained in the previous chapter such questions would end with a rising tone.

As per the analysis provided in pitch analysis section of this figure, it is quite visible that the sentence ended with a rising tone. The ascending arrow in this figure shows the location of rising tone in the pitch analysis section.

Hence the NS's utterance is intelligible enough to be considered as an intelligible utterance for the purpose of learner's intelligibility evaluation.

Figure 6.17: Learner's Intelligibility Analysis for Sentence 7



The Figure 6.17 shows the learner's digital voice analysis for the sentence 7 "You are moving?". As it was explained before, the sentence is question type sentence but built in the form of a statement structure in which maintaining proper intonation is essential for recognizing the sentence as a question. The sentence is a question type sentence with the possibility of either "yes" or "no" answer in return in which the speaker expresses his/her uncertainty about the answer. As it was explained before, the sentence should end with a rising tone. The analysis provided in pitch analysis section of this figure shows that the learner ended the sentence with a correct rising tone. The ascending arrow in this figure shows that the pitch level of the voice slid up towards the end of the sentence. All these analyses show that the learner had successfully managed to produce an intelligible utterance.

Figure 6.18: Native Speaker's Intelligibility Analysis for Sentence 8

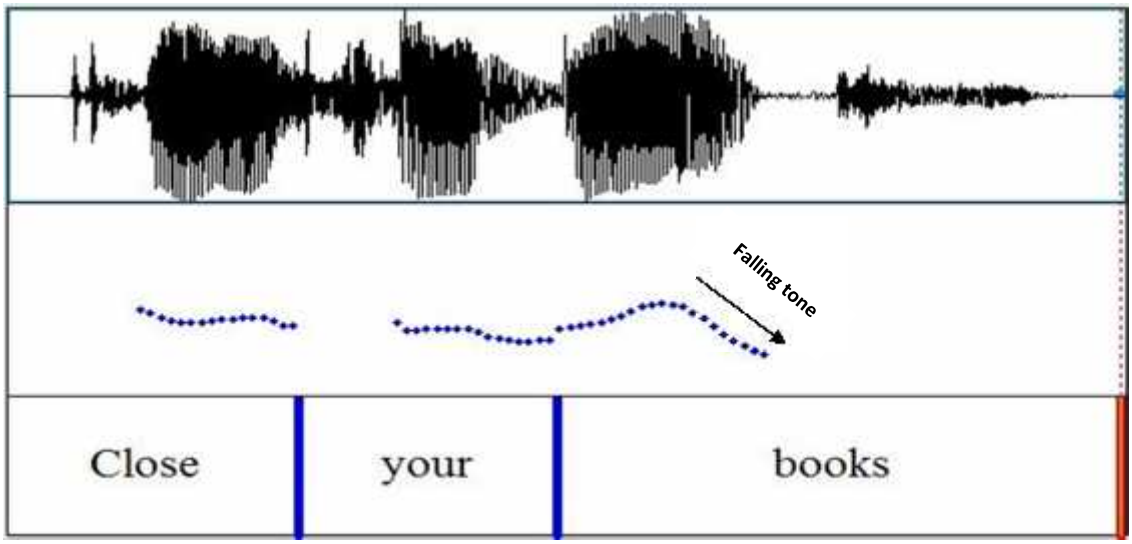
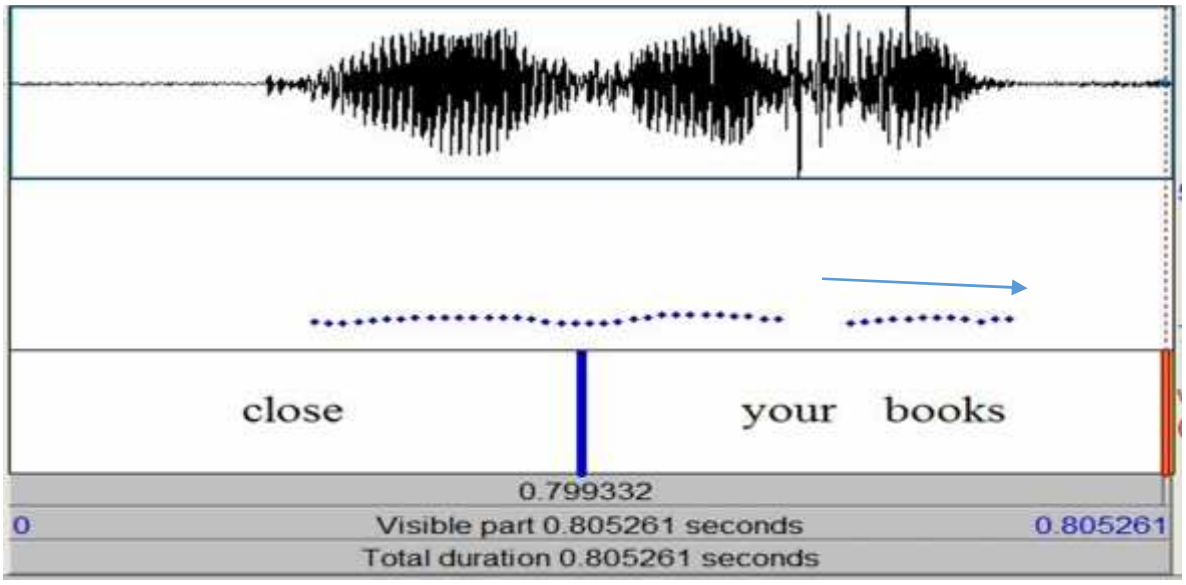


Figure 6.18 shows the native speaker's digital voice analysis for the sentence 8 "Close your books ". The chosen sentence is a command type sentence in which the speaker orders the listener to do a certain task. According to the intonation patterns explained in the previous chapter, such sentence should terminate with a falling tone.

As per the analysis provided in pitch analysis section in this figure, it is quite visible that the sentence ended with a clear and visible falling tone. The descending arrow in this figure demonstrates the location of falling tone in the pitch analysis section.

Hence in this figure, the NS uttered the sentence intelligibly and with proper intonation.

Figure 6.19: Learner's Intelligibility Analysis for Sentence 8



The Figure 6.19 shows the NNS or learner's digital voice analysis for the sentence 8 "Close your books ". As it was already explained the chosen sentence is a command type sentence, and such sentence should terminate with a falling tone at the end of them. As per the analysis provided in pitch analysis section of this figure, it is visible that the learner uttered the sentence with a flat type of intonation which is not correct and the pitch movement throughout the sentence doesn't show any significant falling tone. Therefore the learner had ended the sentence with a flat tone or no intonation.

The pitch analysis and waveforms in the following figure also show a flat type of intonation throughout the sentence as there are no significant pitch contours in the figure which signifies that the pitch movement is almost flat throughout the sentence and it avoided the falling tone from happening.

6.2.4. Data Analysis of Phase 6: Learners' Intelligibility Test for Pre-test2

As it is already mentioned the Phase 6 was about learner's intelligibility test for Pre-test2 (sentence intonation). After conducting this test, then we analyzed learners' obtained score by calculating the number of intelligible utterances of each student. The intelligibility test for Pre-test2 was done after the application of CALL method. The aim of the intelligibility test for Pre-test2 is to evaluate the efficiency of CALL method on learners' skills about sentence intonation.

Data analysis of learners' intelligibility test for Pre-test2 can be stated as follows:

Table 6.2: Data Analysis of Learners' Intelligibility Test for Pre-test2

ID	Intelligible Utterances	% of Intelligible Utterances
L1	14	47%
L2	10	33%
L3	9	30%
L4	9	30%
L5	10	33%
L6	10	33%
L7	16	53%
L8	8	27%
L9	10	33%
L10	11	37%
L11	10	33%
L12	13	43%
L13	16	53%
L14	17	57%
L15	8	27%
Total Questions	30	

In the intelligibility test for Pre-test2, 15 learners were examined that were named from L1 to L15 where the letter "L" stands for "Learner". The Table 6.2 shows every learner's obtained score or number of intelligible utterances along with the percentage of intelligible utterances of each learner. After analyzing the data provided in the Table 6.2, we found that average score obtained by the learners is 11.4intelligible utterances out of 30 questions which show intelligible utterances of the total number of students is 38%. We also found that 20% (3 learners) of the learner scored at least 50% of correct answers.

6.3. Phase 7: Conducting Post-test2 (Sentence Intonation)

After teaching the students about sentence intonation with the help of CALL based approaches, the students were again examined with another test(Post-test2) about intonation similar to Pre-test2. In this phase, a set of 30 questions in the form of *Post-test2* (Appendix4) were distributed among each of the15 learners (1 set of the same questions for each learner). The questions in this post-test were designed to measure the learners' capability in identifying intonation of different types of sentences after learning through CALL based methods. The target tones were the same as it was designed in Pre-test2 i.e. rising tone, falling tone, and a mix of rising and falling tones in a multi-sentences statement. The duration of the test was 20 min.

6.3.1. The Structure of Post-test2

Post-test2 consists of 30 questions. Every question contained a statement which may contain one or two sentences. The learners had to recognize the tone of the sentence according to the type of the sentences which was explained in the parentheses next to every statement. The learners then had to choose the correct intonation of each sentence by tick marking in the boxes below the sentences that provide the option of choosing the proper tone. In order to collect accurate data, the learner had to tick mark the proper tone according to the conducted CALL based approaches to them about the intonation. They were not allowed to seek help from the researcher or other learners.

The researcher in this test tried to choose the similar (not the same) types of sentences which were provided in Pre-test2. Similarly, Post-test2 also contains most common patterns of sentence intonation which are of several types such as falling tone, rising tone and single/consecutive rising tone followed by a falling tone

Like Pre-test2, the sentences were chosen from the following types:

- Ordinary or definite sentences
- Question (Wh question types)
- Question(Yes/no questions type)
- Question(Question tags)
- Question (Implicational type)
- Questions (Ordinary type)
- Question (Non-polarity type)
- Question(Expecting positive response)
- Question (Expressing doubt)
- Question(Alternative)
- Enumerating sentence
- Exclamation
- Command
- Introductory phrase

For the following test, the researcher chose 12 sentences which are pronounced with falling tone, 11 sentences pronounced with a rising tone and 7

sentences that are pronounced with single/consecutive rising tone followed by a falling tone.

6.3.2. Data Analysis of Phase 7

Data analysis of Phase 7 can be stated as follows:

In Post-test2, 15 learners were examined that were named from L1 to L15 where the letter "L" stands for "Learner". Table 6.3 shows every learner's obtained score (number of correct answers) along with the correct answer percentage of each learner. After analyzing the data provided in Table 6.3, we found that average score of correct answers obtained by the student is 14.3 out of 30 questions and correct answers percentage of the total number of students is 48%. We also found that 53.3% (8 learners) of the learners scored at least 50% of correct answers which is a considerable result if comparing to the same variable in Pre-test2 which was 33 %(5 learners).

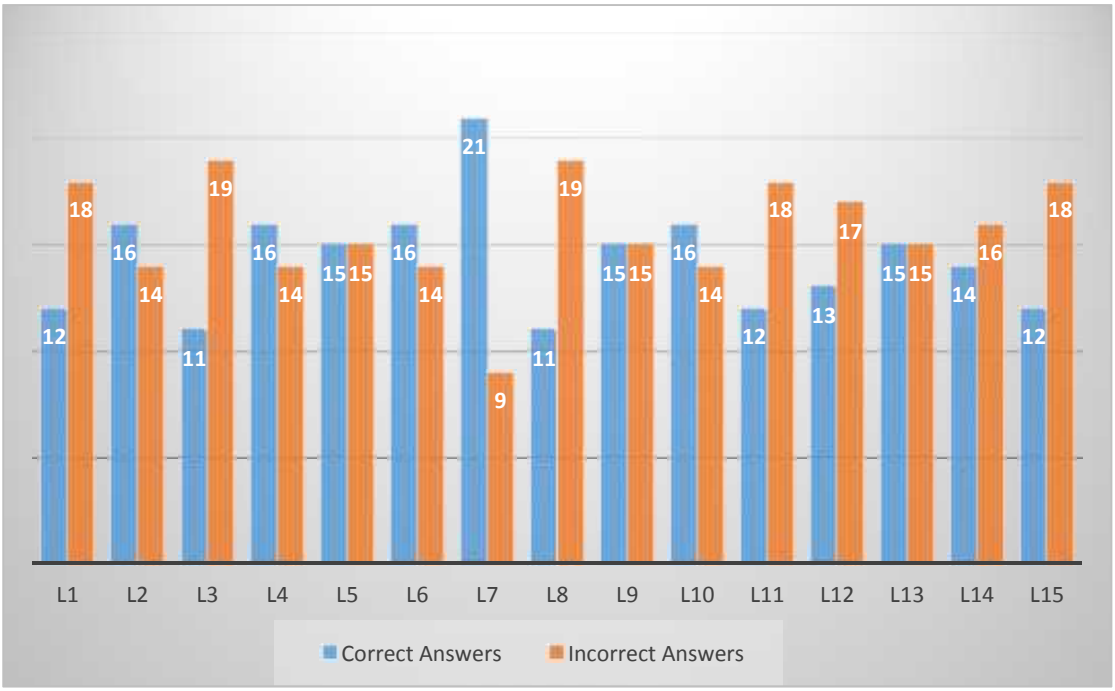
Table 6.3: Scores and Percentage of Correct Answers Obtained by Learners in Post-test2

ID	Correct Answers	% of Correct Answers
L1	12	40%
L2	16	53%
L3	11	37%
L4	16	53%
L5	15	50%
L6	16	53%
L7	21	70%
L8	11	37%
L9	15	50%
L10	16	53%
L11	12	40%
L12	13	43%
L13	15	50%
L14	14	47%
L15	12	40%
Total Questions:	30	

The chart in Figure 6.20 also demonstrates a comparison between correct answers and incorrect answers given by each learner (L1 to L15) by relatively

showing the number of correct and incorrect answers on top of each bar for each learner.

Figure 6.20: Comparison of Correct Answers and Incorrect Answers of Learner. (Pre-test2)



6.4. Phase 8: Learners' Intelligibility Test for Post-test2

After conducting and completing Post-test2 by the researcher and learners, in this phase, the researcher asked every learner to read out the sentences with the same intonation that they chose to be correct in their Post-test2. The researcher then started to collect voice samples of the learners by recording their voice for the pronunciation of each word for further intelligibility analysis and evaluation with Praat voice analyzer software. This intelligibility test was conducted to measure intelligibility improvement of the learners after application of CALL method on them.

6.4.1. Digital Voice Analysis of Post-test2 for Intelligibility Evaluation of Learners

For analyzing the accuracy of voice samples of learners, the researcher needed to compare their voice samples with a native speakers' one. The procedure was started by demonstrating the digital voice analysis of each word pronounced by a native speaker with the help of Praat software. Since there was no access to a native speaker

in Aligarh Muslim University at the time of data collection, hence the researcher used an internet-based Text to Speech (TTS) machine which is provided in www.oddcast.com website. This TTS machine provides a clear natural human voice for the pronunciation of words or sentences with proper stress and intonation. It is also capable of pronouncing words and sentences in different native English accents such as British, American, Australian, etc. The researcher used American English accent for his pronunciation sample with the help of Praat Software. The reason that the researcher chose the American English accent is because American speakers are considered as one of the most popular native English speakers in the world hence their accent would be one of the most intelligible accents as well.

In this section, the researcher made a computerized comparison of voice sample uttered by native speaker and learners and will calculate the average intelligibility of learners in pronouncing with proper sentence tone. Due to the limitation of pages of this chapter and for the sake of saving paper the researcher mentioned the digital tone analysis of eight sentences, and then he chose the voice sample of the same eight sentences from eight different random learners. In order to achieve a transparent and clear result, the researcher chose eight sentences with different tone such as rising, falling or single/consecutive rising followed by a falling tone.

The researcher chose the following eight sentences from Post-test2 for the sample digital analysis of both the native speaker and learners' voice.

1. Where is he from?(Wh question).
2. She has bought a new car. (Statement).
3. Could you give me a pen please?(Expecting either positive or negative reply).
4. Do you like Delhi or Mumbai?(Alternative question).
5. What a beautiful peacock! (Exclamatory).
6. I have been to India, France, England, and United States.(Enumerating sentence).
7. You know what I'm talking about, don't you? (Expecting positive or negative).
8. Turn off the light. (Command sentence).

Figure 6.21: Native Speaker's Intelligibility Analysis for Sentence 1

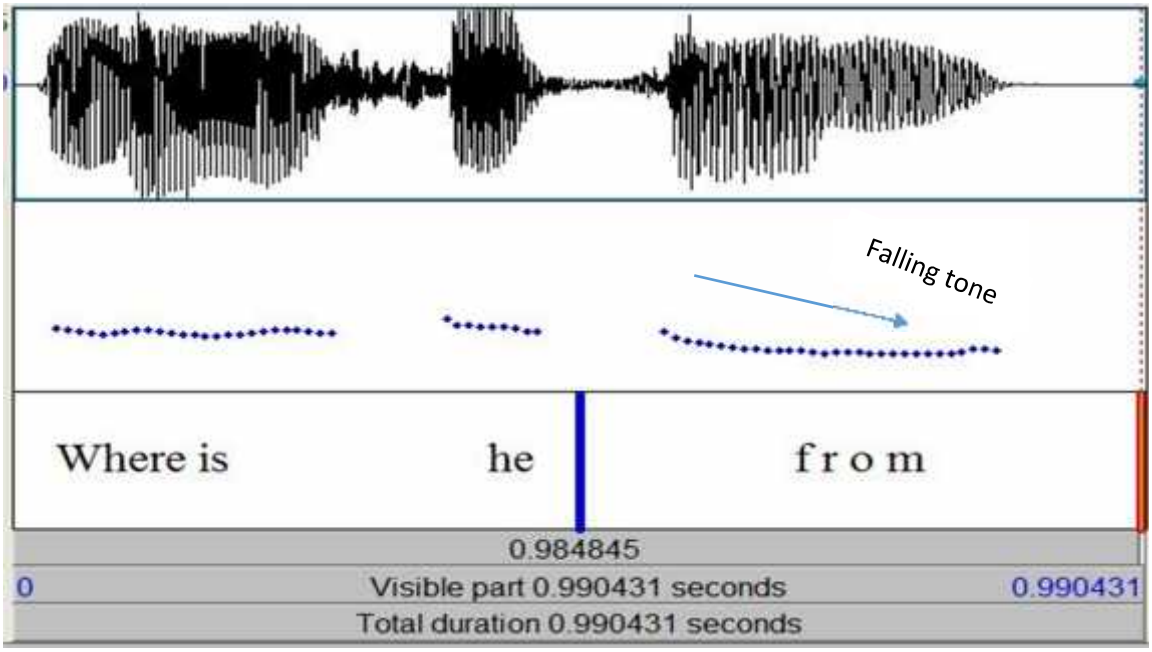


Figure 6.21 shows the native speaker's (NS) voice analysis for the sentence 1 "Where is he from? ". The chosen sentence is an ordinary "wh" question type sentence in which the speaker expects an ordinary reply from the listener and the listener should give a name of a country or place as the response. According to the intonation patterns explained in the previous chapter, such questions will follow with a falling tone at the end of them.

As per the analysis provided in pitch analysis section of this figure, it is quite visible that the sentence ended with a slight falling tone. The descending arrow in this figure shows the location of rising tone in the pitch analysis section.

Hence the NS's utterance is considered as an intelligible one as the Praat software demonstrated the falling tone in this figure.

Figure 6.22: Learner's Intelligibility Analysis for Sentence 1

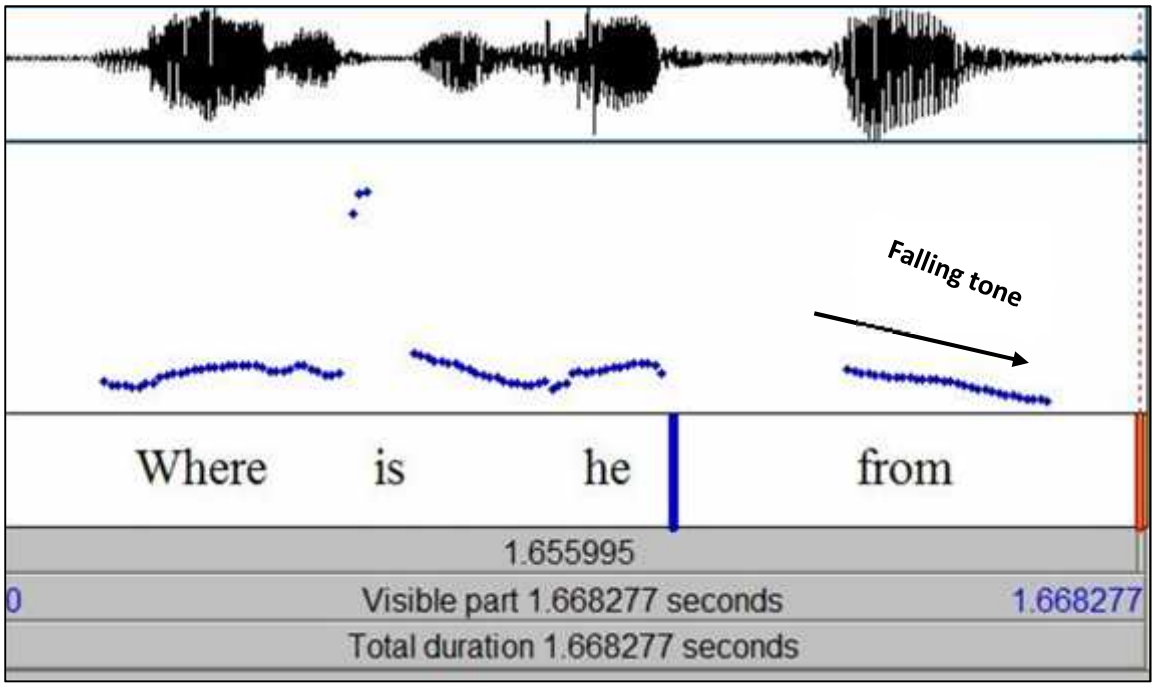


Figure 6.22 shows the learner's voice analysis for the sentence1 "where is he from". As it was explained before, the above-mentioned sentence is an ordinary statement which should end with falling tone. As per the analysis provided in pitch analysis section of this figure, it is visible that the sentence ended with a slight falling tone at the end of it which shows that the learner had uttered the sentence with correct falling tone. The descending arrow in this figure shows the location of falling tone at the sentence.

By comparing the two figures which show the digital voice analysis of the same sentence uttered by a native speaker and the learner, we can find that the learner ended the sentence with a suitable and correct falling tone in a similar way that we see for the native speaker's utterance in Figure 6.21.

Figure 6.23: Native Speaker's Intelligibility Analysis for Sentence 2

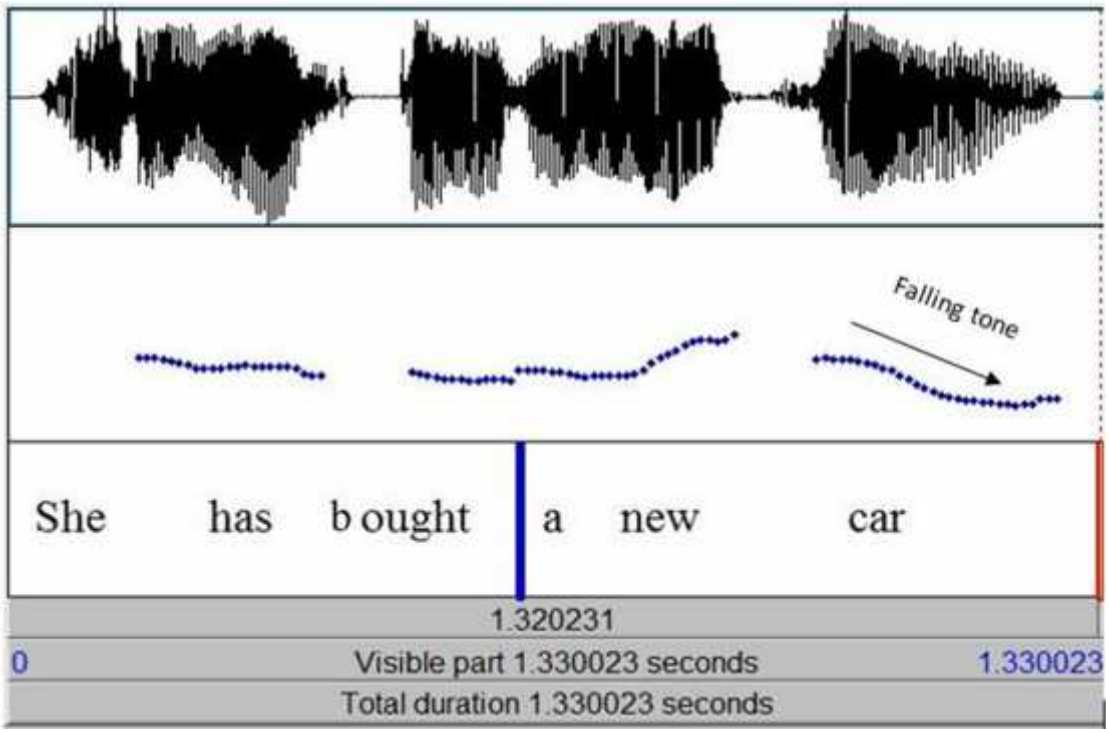


Figure 6.23 shows the Native Speaker's (NS) voice analysis for the sentence 2 "She bought a new car". As it was explained about the intonation patterns in the previous chapter, the above-mentioned sentence is a statement which should end with a falling tone. As per the analysis provided in pitch analysis section of this figure, it is visible that the sentence correctly ended with a falling intonation.

The pitch analysis and waveforms in the following figure show a proper pitch movement throughout the sentence, and there are significant pitch contours in the figure which shows suitable pitch movement throughout the sentence. The descending arrow in the figure shows the location of falling tone in the sentence.

Hence the NS's utterance is considered as an intelligible one and suitable for learners' intelligibility evaluation.

Figure 6.24: Learner's Intelligibility Analysis for Sentence 2

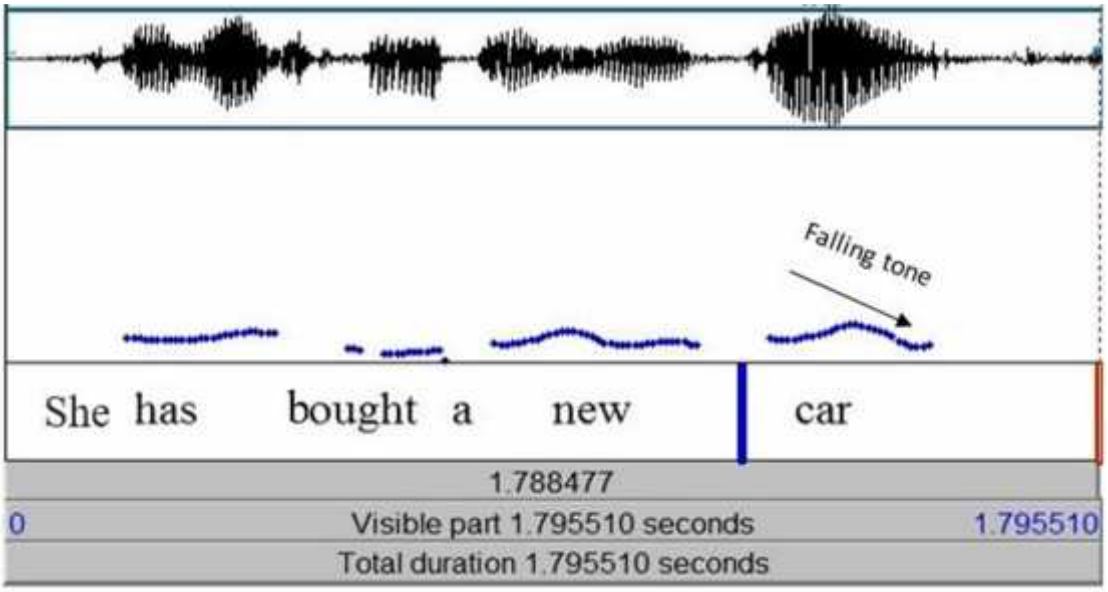


Figure 6.24 shows the learner's voice analysis for the sentence 2 "She bought a new car". As it was already explained in the previous figure, the above-mentioned sentence is a statement which should end with a falling tone. The analysis provided in the pitch analysis section of this figure shows that the learner managed to end the sentence with a slight falling intonation. The pitch contour and waveforms analysis of the figure also shows a slight pitch movement throughout the sentence. The descending arrow in the figure shows the location of falling tone in the sentence.

Hence the above analysis for this learner shows that he produced an intelligible utterance for this sentence.

Figure 6.25: Native Speaker's Intelligibility Analysis for Sentence 3

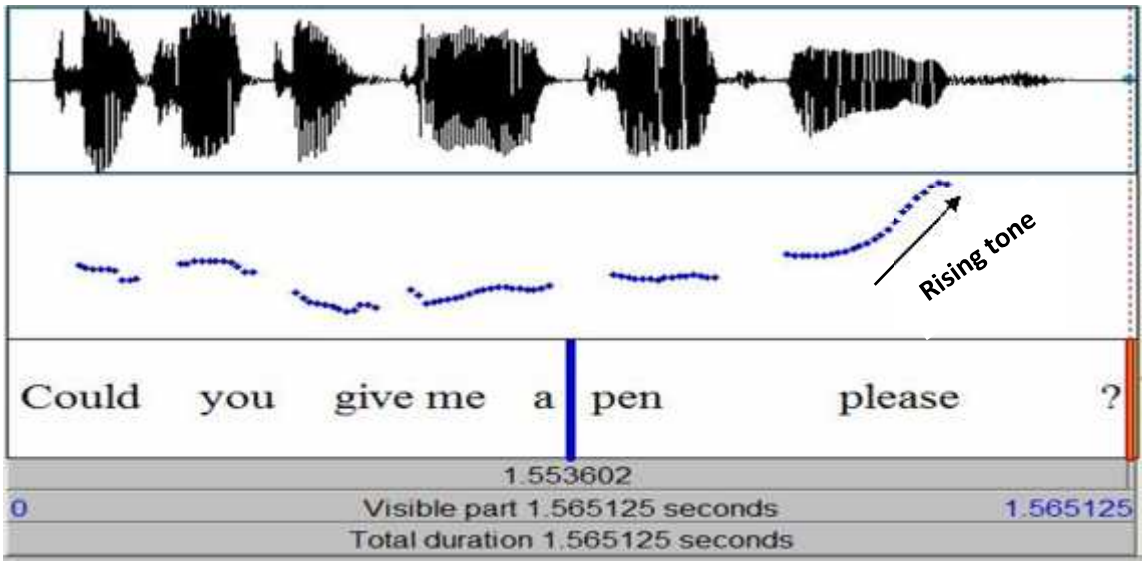


Figure 6.25 shows the native speaker's (NS) voice analysis for the sentence 3 "Could you give me a pen please? ". The chosen sentence is a question type sentence with the possibility of either "yes" or "no" answer in return. According to the different intonation pattern explained in the previous chapter such questions would end with a rising tone.

As per the analysis provided in pitch analysis section of this figure, it is quite visible that the sentence correctly terminated with a rising tone. The ascending arrow in this figure shows the location of rising tone in the pitch analysis section. It is also noticeable that there is a suitable pitch movement throughout the sentence.

Therefore the NS in this Figure has produced an intelligible utterance which will be used for learner's intelligibility evaluation and comparison for this sentence.

Figure 6.26: Learner's Intelligibility Analysis for Sentence 3

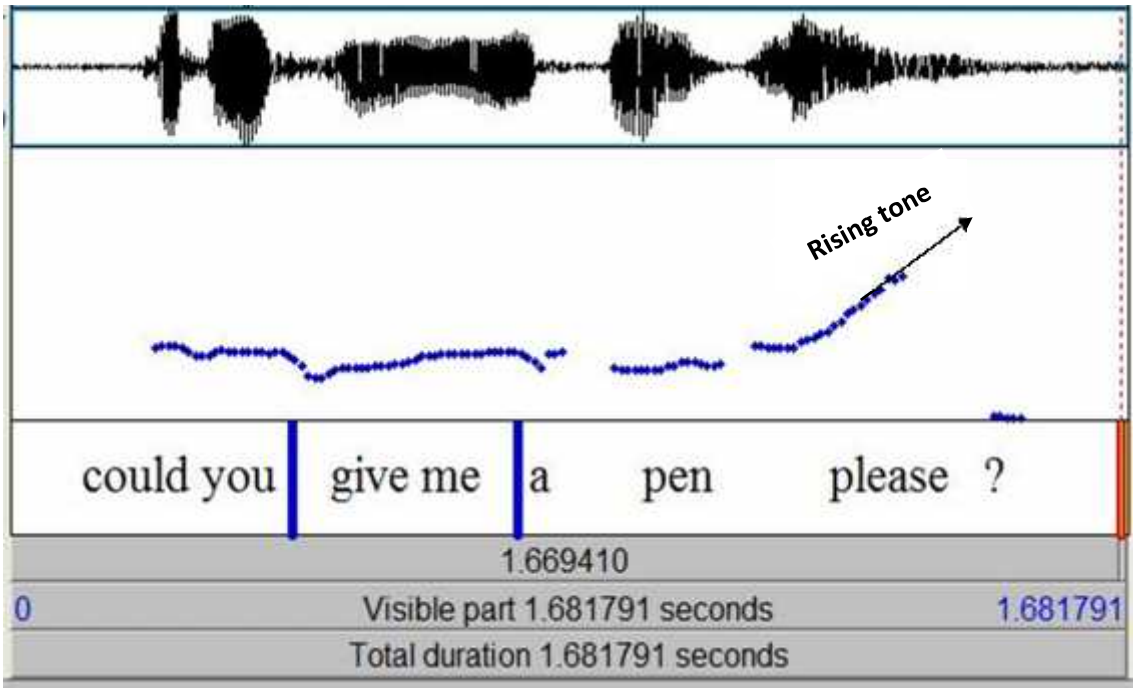


Figure 6.26 shows the learner's or NNS's voice analysis for the sentence 3 "Could you give me a pen please?". As it was explained in the previous figure, The sentence is a question type sentence with the possibility of either "yes" or "no" answer in return, and it should end with a rising tone. The analysis provided at pitch analysis section of this figure shows that that the learner had ended the sentence with a visible correct rising tone. The ascending arrow in this figure shows that the pitch

level of the voice slid down towards the end of the sentence. The above analysis shows that the learner had uttered the sentence intelligibly and with correct tone.

By comparing this figure which shows the digital voice analysis of the learner with the previous figure (Figure 6.25) which shows the digital voice analysis of the same sentence uttered by the native speaker, we can observe that despite the correct sentence intonation uttered by the learner, he couldn't maintain a suitable pitch movement before the rising intonation at the end of the sentence as the level of pitch contours are very close together where the pitch contour analysis in Figure 6.25 relating to native speaker shows a suitable difference at the level of pitch contours and also proper pitch movement throughout the sentence.

Figure 6.27: Native Speaker's Intelligibility Analysis for Sentence 4

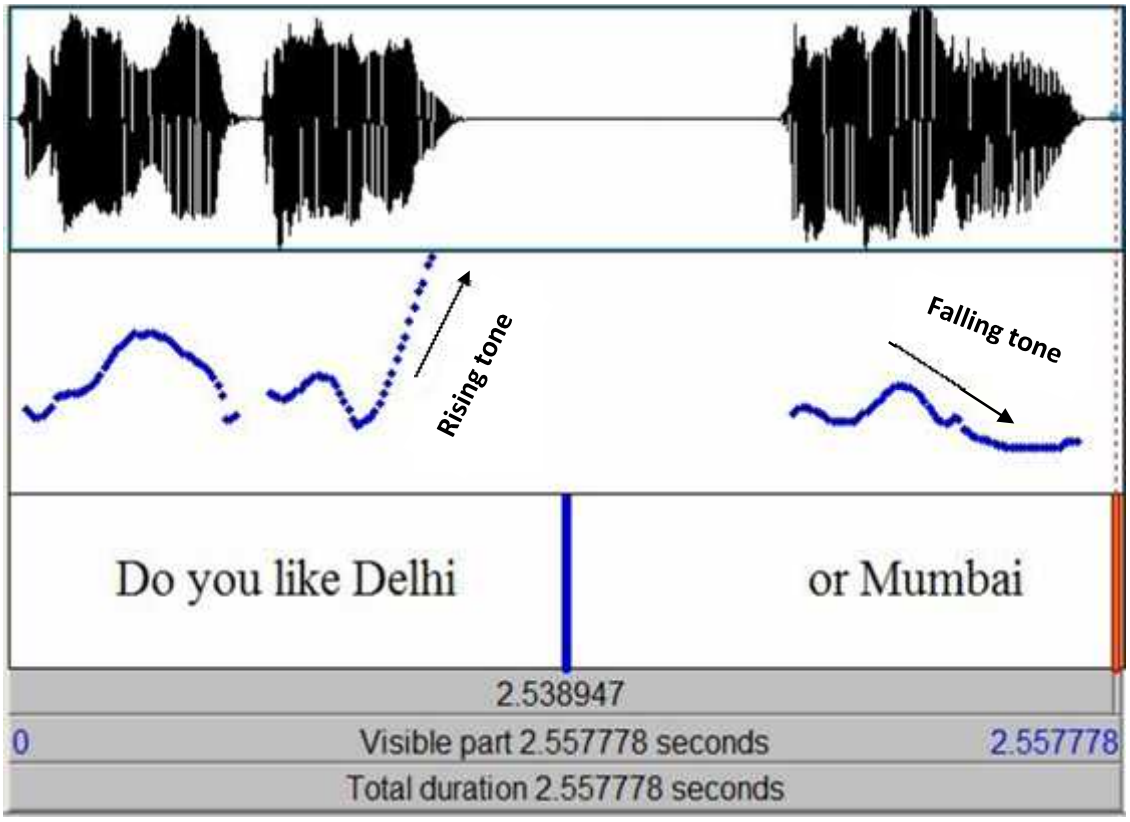
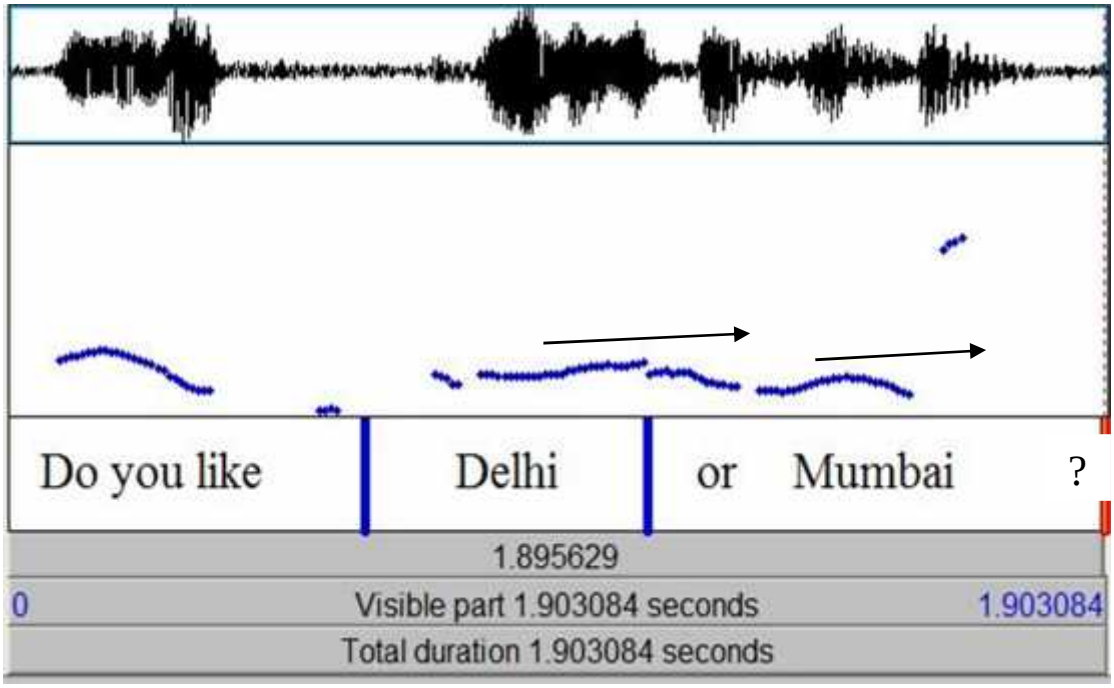


Figure 6.27 shows the native speaker's (NS) digital voice analysis for the sentence "Do you like Delhi or Mumbai?". The sentence is an alternative type of question which provides multiple choices in a sentence. As it was explained in the previous chapter about the sentence intonation patterns, in such sentences all choices prior to the last choice will get a rising intonation, and the last choice will end the sentence with a falling tone.

The pitch analysis of the above figure for the NS shows the correct rising tone at the first choice (Delhi) which is shown with an ascending arrow and a falling tone at the second choice (Mumbai) which is signified with a descending arrow. The suitable pitch movement throughout this sentence is also significantly recognizable through a different level of pitch contours in the sentence.

Therefore the NS's utterance is considered as an intelligible utterance.

Figure 6.28: Learner's Intelligibility Analysis for Sentence 4



The above figure shows the learner's (NNS) digital voice analysis for the sentence "Do you like Delhi or Mumbai?". As it is already explained in the previous figure, this sentence is an alternative type of question with multiple choices and all choices prior to the last choice will get a rising tone and the last choice will end the sentence with a falling tone.

As per the analysis provided in pitch analysis section of this figure, it is quite visible that the learner couldn't put a rising intonation at the first choice (Delhi) and the tone of his voice for the second choice (Mumbai) is almost a flat tone rather than a falling tone. The two flat arrows in this figure show that the pitch level of the voice didn't change towards both the choices in the sentence. Therefore the aforesaid

analysis shows that the learner had failed in uttering the sentence with correct tone and his utterance cannot be considered as an intelligible one.

By comparing this figure which show the digital voice analysis of the learner with the previous figure which shows the digital voice analysis of the same sentence uttered by the native speaker, we can find that in learner's digital voice analysis, pitch contours and waveforms analysis show that he couldn't maintain an acceptable pitch movement throughout the sentence. We can also observe that there is significant silence area between the two choices in native speaker's voice analysis and the time duration analysis of the two figures shows that the learner ended the sentence in the time duration of 1.9 seconds where the native speaker spent 2.5 seconds to finish the sentence. This signifies that the learner uttered the sentence faster than the native speaker which can be the reason that he failed in uttering the sentence with correct intonation and suitable pitch movement.

Figure 6.29: Native Speaker's Intelligibility Analysis for Sentence 5

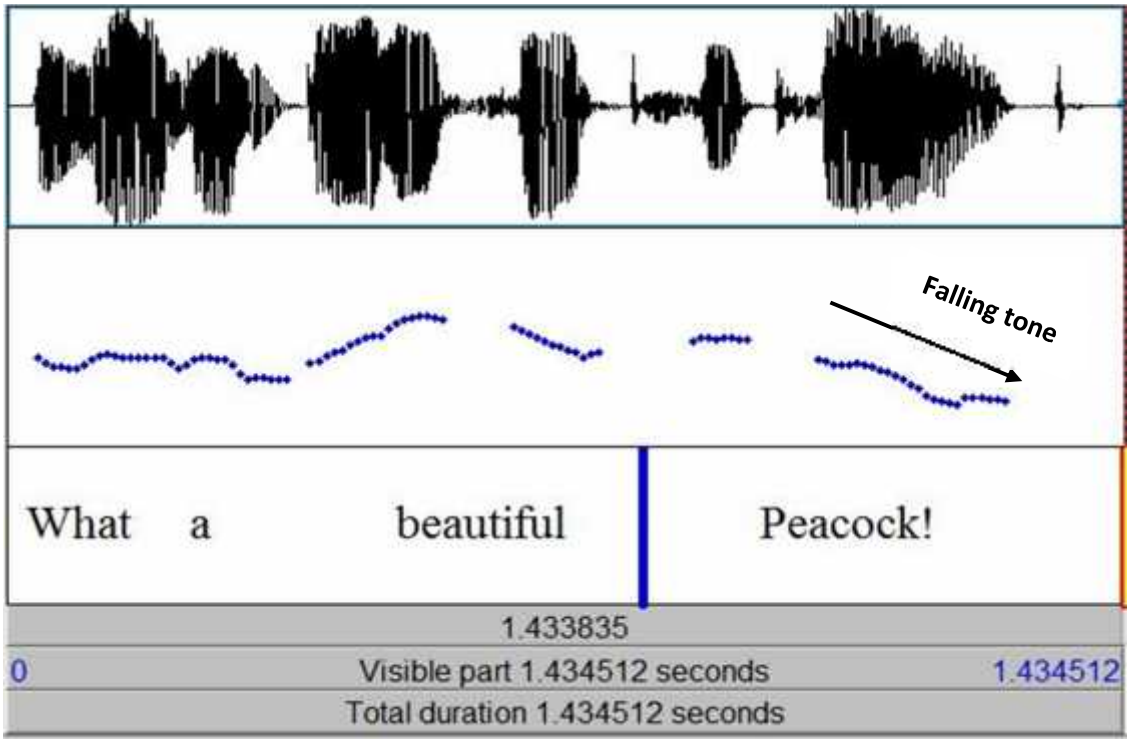


Figure 6.29 shows the Native Speaker's (NS) voice analysis for the sentence 5 "What a beautiful Peacock! ". The following sentence is an exclamatory utterance, and according to the intonation patterns explained in the previous chapter, such questions will end with a falling tone.

As per the analysis provided in pitch analysis section of this figure, it is quite visible that the sentence correctly ends with a visible falling tone. The descending arrow in this figure shows the location of falling tone in the pitch analysis section. The pitch analysis section in this figure also shows a noticeable pitch movement throughout the sentence.

Thus the following analysis shows that the NS produced an intelligible utterance and it can be used for learners' intelligibility analysis and evaluation for the same sentence.

Figure 6.30: Learner's Intelligibility Analysis for Sentence 5

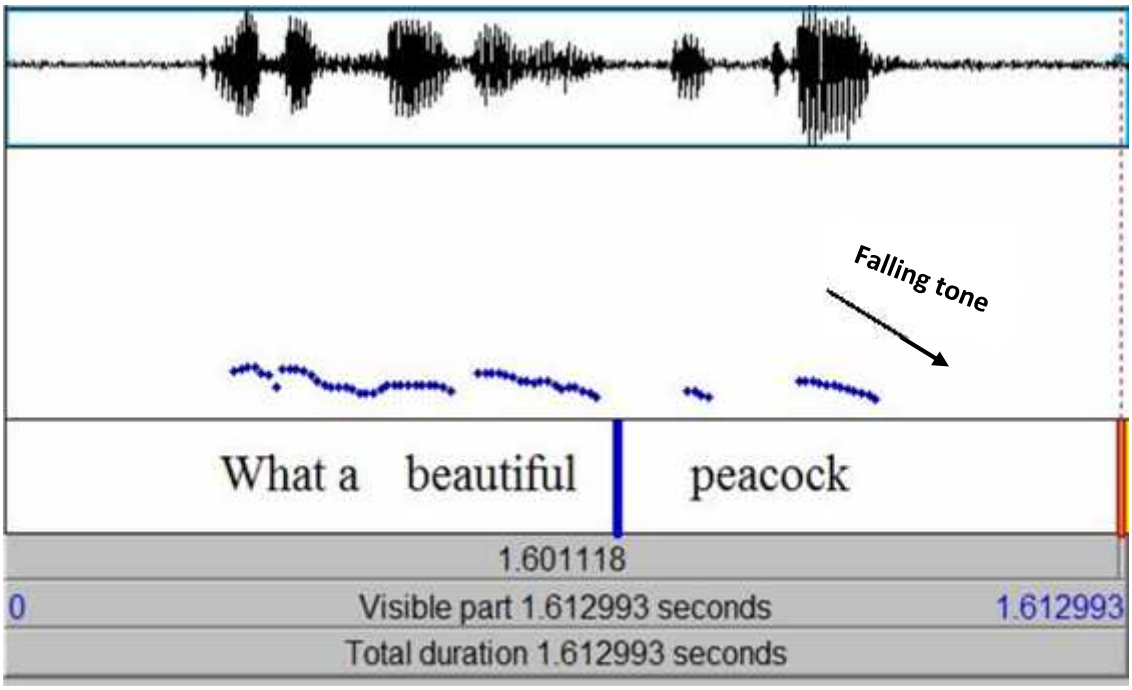


Figure 6.30 shows the learner's (NNS) voice analysis for the sentence 5 "What a beautiful peacock!". As it was explained before, the above-mentioned sentence is an exclamatory type of sentence which should end with a falling tone. The pitch analysis section in this figure, shows that the learner uttered the sentence with a very weak falling intonation which can be approximately considered as flat type of intonation and the weak pitch movement throughout the sentence shows that the learner couldn't utter the sentence with a full falling tone at the end of it and he produced a weak falling tone. The descending arrow in this figure shows the location of falling intonation.

Despite the weak falling tone uttered by the NNS, we can consider it as an intelligible utterance as there is a slight falling tone towards the end of the sentence.

By comparing this figure which show the digital voice analysis of the learner with the previous figure which shows the digital voice analysis of the same sentence uttered by the native speaker, we can observe a significant difference at the level of pitch contours at native speaker's digital analysis in Figure 6.29 wherein Figure 6.30 the learner couldn't produce proper pitch movement throughout the sentence and that can be the reason that his utterance is less intelligible than the native speaker's one.

Figure 6.31: Native Speaker's Intelligibility Analysis for Sentence 6

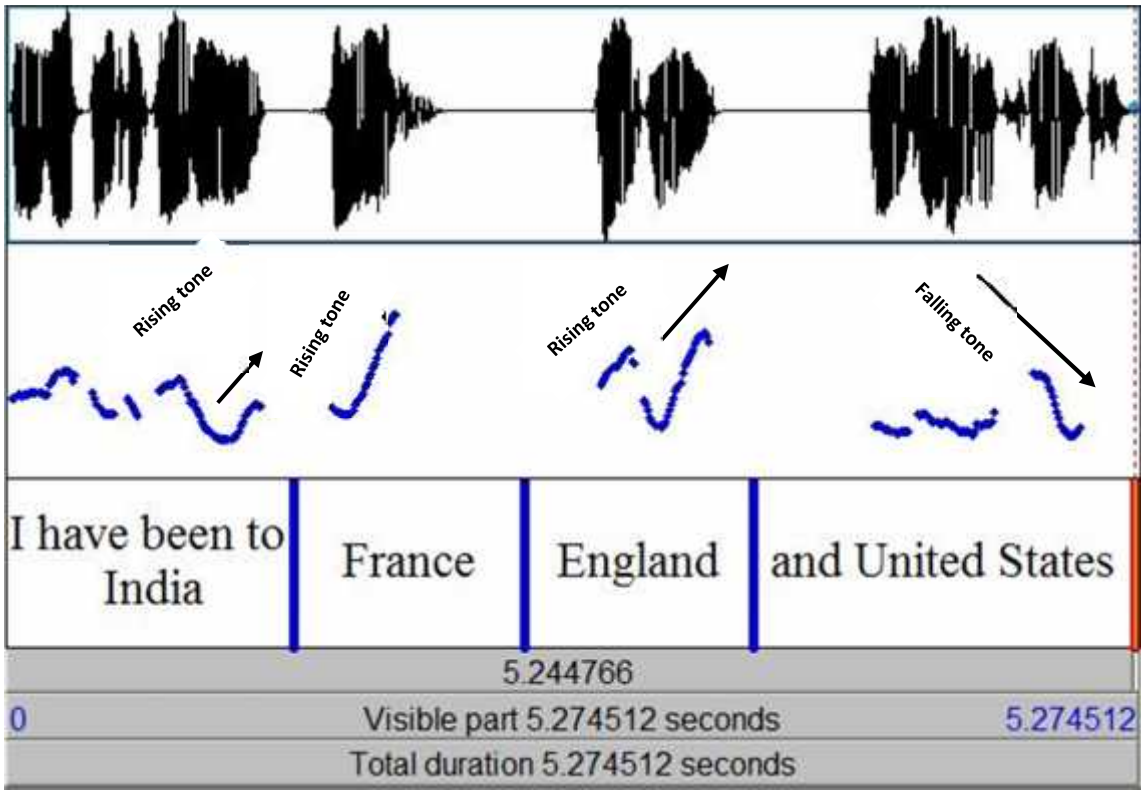


Figure 6.31 shows the native speaker's voice analysis for the sentence 6 "I have been to India, France, England, and United States.". The following sentence is an enumerating type of utterance. According to the various patterns of intonation which were explained in the previous chapter, in enumerating sentence, all items which are prior to the last item will be followed by a rising tone on each of them and the last item will terminate the sentence with a falling tone.

As per the analysis provided at pitch analysis section of this figure, it is quite visible that except the last item which ends the sentence with a falling tone, other items show a rising tone on their pitch analysis. The arrows in this figure show the location of rising and falling tone of each item at the pitch analysis section. The

digital voice analysis in this figure visibly shows that the native speaker accurately uttered the sentence with correct and accurate intonation throughout the sentence.

Thus we can consider the NS's utterance as an intelligible one which can be used as a suitable utterance for learner's intelligibility evaluation and analysis.

Figure 6.32: Learner's Intelligibility Analysis for Sentence 6

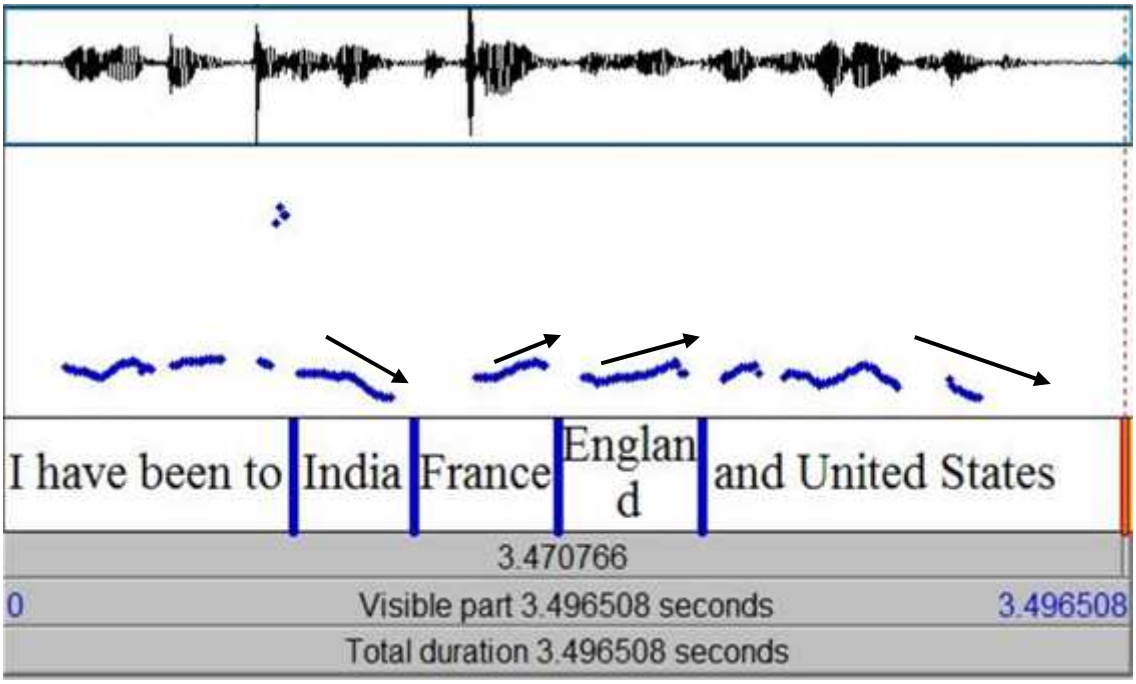


Figure 6.32 shows the learner's voice analysis for the sentence 6 "I have been to India, France, England, and United States..". As it was already explained in the previous figure, the following sentence is an enumerating type of utterance, and in such sentences, all items which are prior to the last item will be followed by a rising tone on each of them and the last item will terminate the sentence with a falling tone.

The analysis provided at pitch analysis section of this figure shows that the learner couldn't produce an accurate intonation while uttering the sentence as the pitch movement of his voice is weak and tended to be flat. By a deeper analysis of the figure it is observable that the learner produced a wrong falling tone at the first item (India), correct rising tone on the second item (France), a correct rising tone at the third item(England) and a correct falling tone at the last item(United States). Therefore the learner weakly produced the correct tone for last three items. The ascending and descending arrows on the figure throughout the sentence show the location of rising and falling tones.

By comparing this figure with the previous figure (Figure 6.31) which shows the digital voice analysis of the same sentence uttered by the native speaker, we can find that the learner ended the sentence in the time duration of 3.4 seconds where the native speaker spent 5.2 seconds to finish the utterance. This signifies that the learner uttered the sentence faster than the native speaker which can be the reason that he failed in saying the sentence with correct intonation. Comparison of the waveforms and pitch movement in the two figures shows that in native speaker's utterance, there is a brief silence zone after each item which helps the speaker to follow the correct intonation where the learner failed in performing the same.

Hence according to above-mentioned analysis and its explanation, we conclude that the learner's utterance is not intelligible.

Figure 6.33: Native Speaker's Intelligibility Analysis for Sentence 7

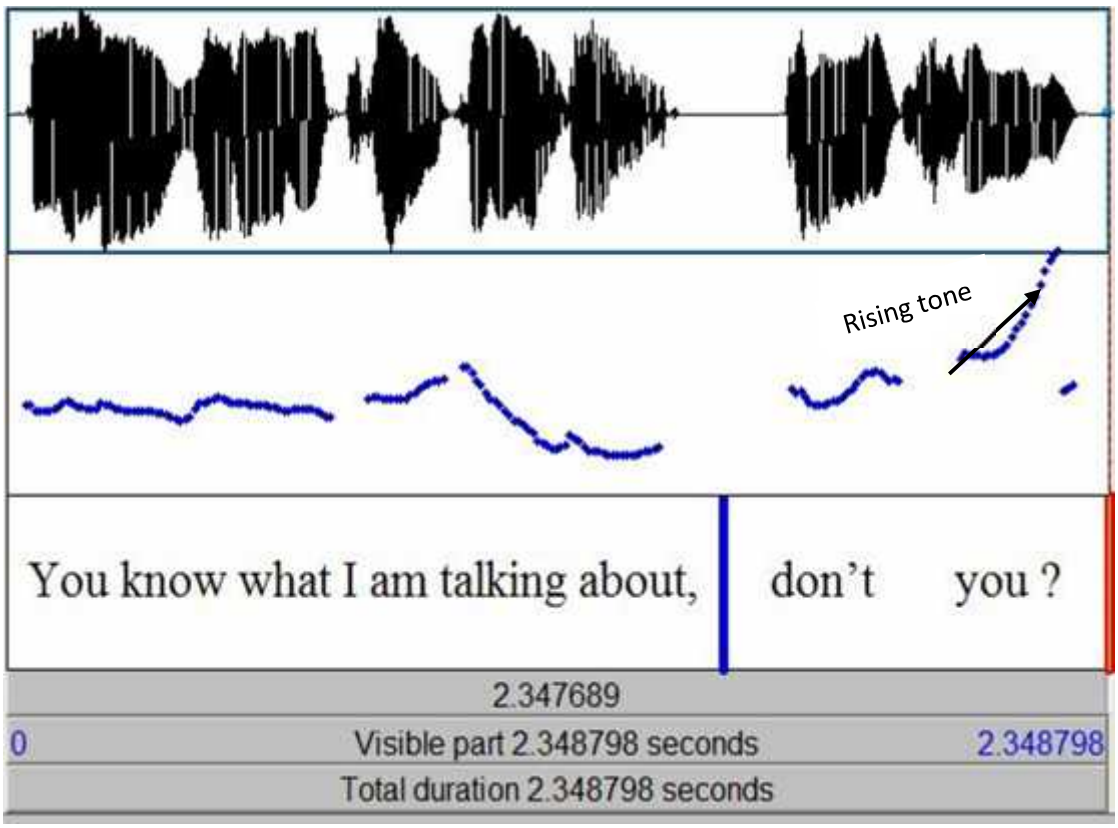


Figure 6.33 shows the Native Speaker's (NS) voice analysis for the sentence 7 "You know what I am talking about, don't you? ". The chosen sentence is a yes/no question tag sentence in which the speaker expects an either positive or negative reply

from the listener. According to the different intonation patterns explained in the previous chapter, such questions will follow with a rising tone at the end of them.

As per the analysis provided at pitch analysis section of this figure, it is quite visible that the learner accurately ended the sentence with a clear rising tone. The ascending arrow in this figure shows the location of rising tone in the pitch analysis section. Moreover, the different level of pitch contours on the figure shows that the native speaker had maintained a suitable pitch movement throughout the sentence.

Therefore NS's utterance is an intelligible one as the software showed the intonation of the sentence correctly. This utterance is suitable enough to be used as a sample for learner's intelligibility evaluation for the same sentence.

Figure 6.34: Learner's Intelligibility Analysis for Sentence 7

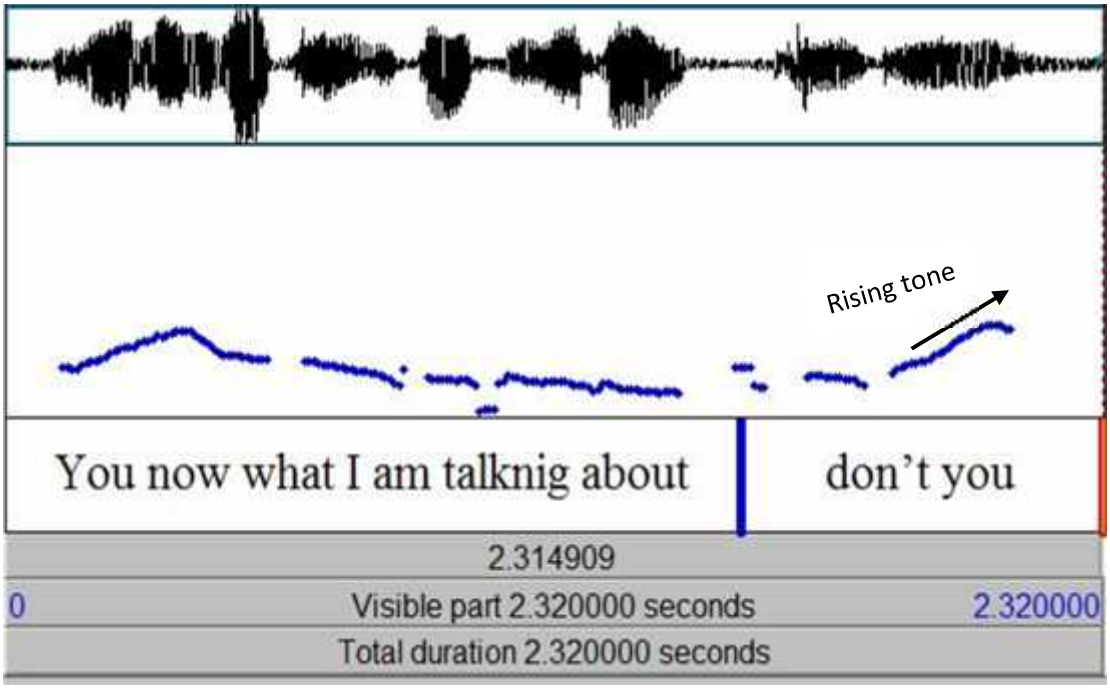


Figure 6.34 shows the learner's voice analysis for the sentence 7 "You know what I am talking about, don't you?". The chosen sentence is a yes/no question tag sentence in which the speaker expects an either positive or negative reply from the listener because s/he is not sure about the answer. As it was explained before, the sentence should end with a rising tone and the analysis provided in pitch analysis section of this figure, shows that the learner ended the sentence with an accurate rising tone. The ascending arrow in this figure shows that the pitch level of the voice

slid up towards the end of the sentence. The aforesaid analysis shows that the learner had successfully performed in uttering the sentence with correct rising tone.

By comparing this figure which shows the digital voice analysis of the learner with the previous figure that shows the digital voice analysis of the same sentence uttered by the native speaker, we can find that in learner's voice analysis, the level of pitch contours and waveforms show an acceptable pitch movement in his voice throughout the sentence but it is worth to mention that the pitch movement in native speaker' voice analysis is stronger and more accurate than learner's which proved that the native speaker sounds more intelligible than the learner.

According to the above-mentioned analysis, we can conclude that the learner was successful in producing an intelligible utterance.

Figure 6.35: Native Speaker's Intelligibility Analysis for Sentence 8

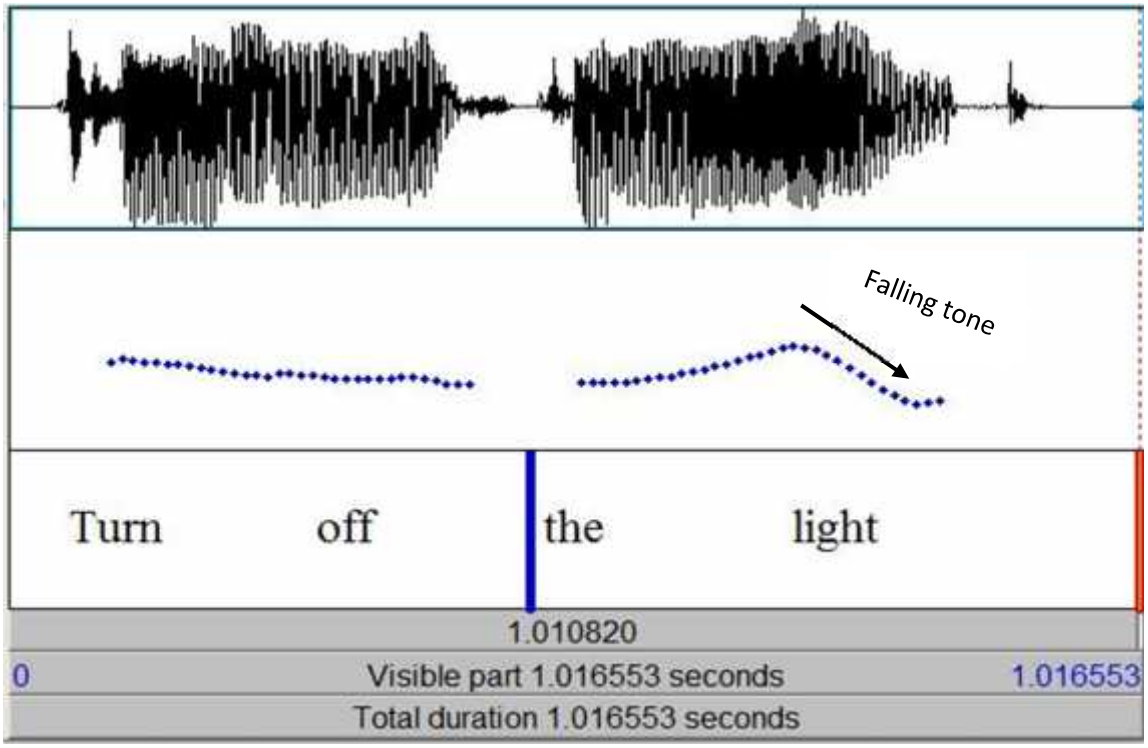


Figure 6.35 shows the native speaker's voice analysis for the sentence 8 "Turn off the light ". The chosen sentence is a command type of sentence in which the speaker orders the listener to do a certain task. According to the intonation patterns explained in before in the previous chapter, such sentence will end with a falling tone.

The analysis provided in pitch analysis section of this figure, demonstrates that the native speaker had accurately terminated the sentence with a clear and visible falling tone. The descending arrow in this figure shows the location of falling tone at the pitch analysis section.

As the time duration on the lower part of the figure shows (one second), due to the type of the sentence which is short in length, we can't significantly analyze the level of pitch contours and the pitch movement throughout the sentence. As it is shown in the figure the only recognizable pitch movement in this figure is at the end of the sentence which shows the falling tone of the sentence.

Thus the above analysis shows that the NS has produced an intelligible utterance which can be used for learner's intelligibility analysis and evaluation for this sentence.

Figure 6.36: Learner's Intelligibility Analysis for Sentence 8

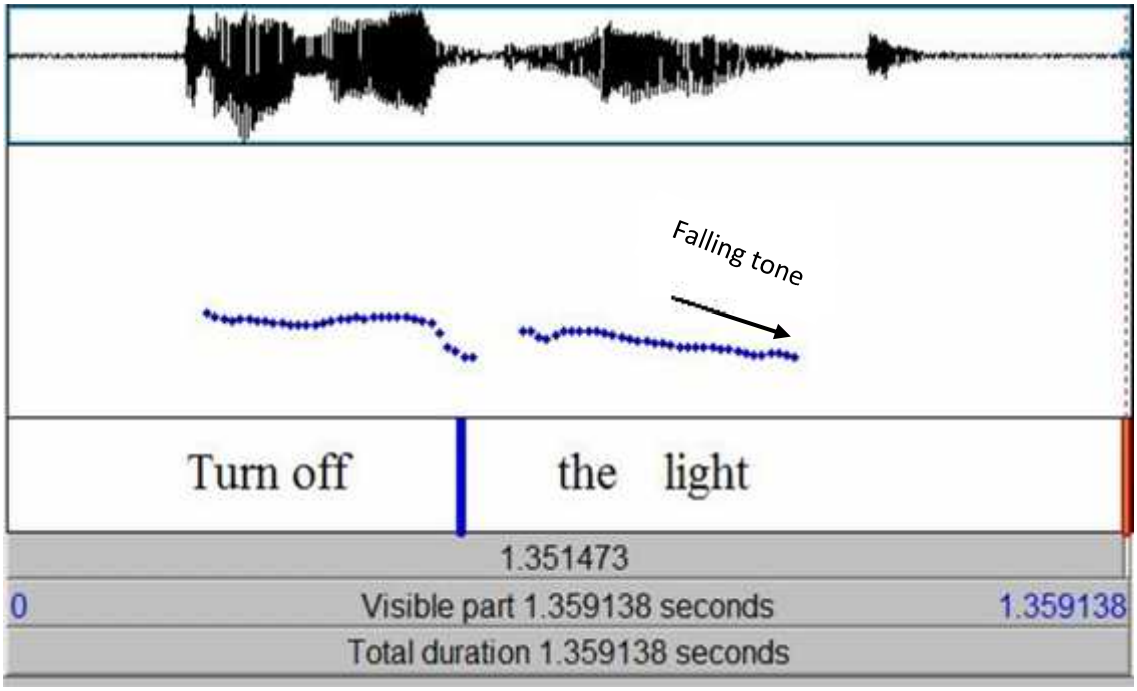


Figure 6.36 shows the learner's digital voice analysis for the sentence 8 "Turn off the light ". As it was already explained the chosen sentence is a command type sentence, and such sentence should terminate with a falling tone at the end of them. As per the analysis provided in pitch analysis section in this figure, it is visible that the learner uttered the sentence with a weak falling intonation at the end of it. The

pitch movement throughout the sentence is also weak throughout the sentence. The descending arrow in the above figure shows the area of falling tone. Therefore the learner had ended the sentence with a weak falling tone.

The pitch analysis and waveforms in the following figure also show a flat type of intonation throughout the sentence as there are no significant pitch contours in the figure which shows that the pitch movement is almost flat throughout the sentence which avoided the falling tone from happening.

By comparing this figure which shows the digital voice analysis of the learner with the previous figure which shows the digital voice analysis of the same sentence uttered by the native speaker, we can find that in learner's voice analysis, the level of pitch contours and waveforms don't show any significant pitch movement in his voice throughout the sentence, but it is worth mentioning that the pitch movement in native speaker' voice analysis is stronger and more accurate at the end of sentence where the falling tone happened.

Despite the mentioned flaws in learner's (NNS) utterance, we can still consider his utterance as an intelligible one as the main factor in identifying an intelligible utterance in a digital analysis by Praat software is the visibility of intonation in the pitch analysis and the analysis in the above figure shows a slight falling tone at the end of pitch analysis section.

6.4.2. Data Analysis of Phase 8

As it is already mentioned the Phase 8 is about learner's intelligibility test for Post-test2 (sentence intonation). After conducting this test, then we analyzed learners' obtained score by calculating and counting the number of intelligible utterances of each learner. The intelligibility test for Post-test2 was done after the application of CALL method. The aim of the intelligibility test for Post-test2 is to evaluate the efficiency of CALL method on learners' skills about sentence intonation.

Data analysis of intelligibility test of Post-test2 is as follow:

Table 6.4. Data Analysis of Learners' Intelligibility Test for Post-test2

ID	Intelligible utterances	% of Intelligible utterances
L1	12	40%
L2	17	57%
L3	9	30%
L4	11	37%
L5	13	43%
L6	15	50%
L7	18	60%
L8	9	30%
L9	16	53%
L10	13	43%
L11	10	33%
L12	15	50%
L13	17	57%
L14	13	43%
L15	9	30%
Total Questions	30	

In the intelligibility test for Post-test2, 15 learners were examined that were named from L1 to L15 where the letter "L" stands for "Learner". The Table 6.4 shows every learner's obtained score or number of intelligible utterances along with the percentage of the intelligible utterances of each learner. After analyzing the data provided in Table 6.4, we found that average score obtained by the learners is 13.1 intelligible utterances out of 30 utterances which show intelligible utterance percentage of the total number of students is 44%. We also found that 40% (6 learners) of the learners scored at least 50% of correct answers.

Chapter - 7

Conclusion

CHAPTER 7

CONCLUSION

7.1. An Overview of the Study

Assuming the fact that in ELT, especially in the ESL and EFL contexts, use of technology has been under-researched, and that whatever advancement is acquired in using technology in teaching, but it is still limited mainly to the developed countries and/or to some exceptional institutions in the third world. However, it was also assumed that recent trends in language teaching are more popular in the name of Computer Assisted Language Learning (CALL), which has favorably taken shape as learner-centred exercises in the interest of students, encouraging the best practices pertaining to learning and teaching.

In the light of the above, the researcher initiated a research on teaching the undergraduate students using CALL-based Approach at Aligarh Muslim University (AMU), which is one of the best Central Universities in India with "A" Grade by National Assessment & Accreditation Council (NAAC) besides occupying high Institutional Ranking, both nationally (India Today-Nielsen) and internationally (Times Higher Education, UK). AMU is also known for its output in the area of research, publication, citation, H-index, etc.

Ideally, the strategies, instruments, and techniques of CALL should already exist in an institution like AMU. In order to investigate this and also to explore the aspects of using CALL-based approach for teaching, the researcher took up this study, entitled "Teaching Stress and Intonation to Improve Intelligibility of Undergraduate Students of AMU: A CALL-based Approach".

7.2 The Research

The present research aims mainly to identify the objectives of the study in terms of three components; practice, need and the prospect of CALL-based Approach in ESL undergraduate classroom of the university. In this regard, a set of eight tests (two paper pre-tests, two intelligibility pre-tests, two paper post-tests, and two intelligibility post-tests) for 15 students at undergraduate level were designed and piloted for the investigation on the related domain of the study in the session 2015 in the Communicative English Classrooms at AMU.

It would be in the fitness of things to quickly scan the chapters of this thesis as follows:

The first chapter, entitled 'Introduction' provides an outline and the overall conceptualization of this thesis. In this chapter, the researcher has discussed the background and rationale, the methodology, the aims and objectives, the research questions and the proposed chapters of this study. It also highlights the significance of the study.

The second chapter is entitled "A Review of Literature on Pronunciation". It reviews the literature available till date on different strategies for teaching and learning pronunciation based skills with a focus on word stress and sentence intonation in English language pedagogy. The review is spread over several sections; the significance of teaching and learning pronunciation, phonetic, phonology, stress and intonation. It also contains different theories on pronunciation, stress, and intonation by different linguists.

The third chapter of this thesis is entitled as "A Brief History of CALL-based Approach in ELT". It briefly reviews the history of Computer Assisted Language Learning (CALL) in ELT with focus on teaching stress and intonation.

With modern improvements in multimedia equipment, computer-assisted language learning (CALL) has appeared as an enticing substitute to old-style approaches by supplementing or interchanging direct student-teacher interaction, such as the language laboratory or audio-tape-based self-study. The incorporation of sound, voice communication, text, video, and animation has made it possible to generate self-paced interactive learning surroundings that promise to enrich the classroom model of language learning considerably. An increasing number of textbook publishers now provide educational software of some sort, and educators can select among a wide range of different products. Yet, the practical influence of CALL in the area of foreign language education has been rather uncertain.

The fourth chapter, entitled "Application of CALL-based Approach for Current Study" discusses the applied CALL method that is used in this research. This chapter introduces the applied CALL-based approach for teaching stress and Intonation to undergraduate students of AMU. It also introduces the elements that

were used for application of CALL-based approach in this study such as YouTube, Internet, Computer, etc.

The main CALL tool that is used in this research work is Praat software. Praat is a voice analyzer software which can be used for linguistic and pronunciation analyses purposes. In this study Praat is used for the purpose of teaching, learning and evaluating the intelligibility of pronunciation in stress and intonation among the ESL learners at the undergraduate level of AMU.

The fifth chapter entitled "Analysis of Collected Data for Related Tests on Word Stress " provides a detailed analysis and findings of the data collected through Pre-test1, Post-tests1 and their related intelligibility analysis tests. As it was mentioned, in this study, the collection of data for word stress related tests will start from Phase 1 and ends in Phase 4. For the purpose of analyzing and evaluating students' pronunciation intelligibility, Praat software was used. This software was used for identifying and differentiating an intelligible utterance from an unintelligible utterance by a student. The digital voice analysis of a native speaker's pronunciation was used and compared to the students as the ideal and correct pronunciation model. In brief, it has been ensured that this chapter presents a clear understanding of the CALL-based method that was introduced and implemented for evaluating the intelligibility of learners' pronunciation in word stress. In this chapter, analytical comparison for each figure demonstrated in the form of digital pronunciation analysis either for a native speaker or for students. These analyses help in identifying the flaws and errors in learners' pronunciation.

The sixth chapter entitled "Analysis of Collected Data for Related Tests on Sentence Intonation " provides a detailed analysis and findings of the data collected through Pre-test2, Post-tests2 and their related intelligibility analysis tests. The collection of data for word stress related tests will start from Phase 5 and ends in Phase 8. For the purpose of analyzing and evaluating students' pronunciation intelligibility, Praat software was used. This software was used for identifying and differentiating an intelligible utterance from an unintelligible utterance by a student. Like word stress, The digital voice analysis of a native speaker's pronunciation was used and compared to the students as the ideal and correct pronunciation model. In brief, it has been ensured that this chapter presents a clear understanding of the

CALL-based method that was introduced and implemented for evaluating the intelligibility of learners' pronunciation in Sentence Intonation. In this chapter, analytical comparison for each figure demonstrated in the form of digital pronunciation analysis either for a native speaker or for students.

As it was mentioned, in this research we have conducted several tests in different phases to analyze and measure the efficiency of the applied CALL method on the learners. The conducted tests were; Pre-test1, Pre-test2, intelligibility test for Pre-test1, intelligibility test for Pre-test2, Post-test1, Post-test2, intelligibility test for Post-test1 and intelligibility test for Post-test2.

7.2. Findings of the Current Study:

After analyzing the data throughout different tables and figures provided in the previous chapter, it is concluded that the findings and results of the current study for each test can be divided as follows.

- **Pre-test1 (Word Stress)**

In Pre-test1, 15 learners were examined before applying the CALL method. After analyzing the data that is provided in Table 5.1 in the previous chapter, we found that average score obtained by the student is 16 correct answers out of 30 questions and correct answers percentage of total number of students is 46%. We also found that 67% (10 learners) of the learner scored at least 50% of correct answers.

- **Learners' Intelligibility Test for Pre-test1**

In the intelligibility test for Pre-tes1, 15 learners were examined. After analyzing the data provided in Table 5.2, we found that the average intelligible utterance scored by the student is 12.6 correct answers out of 30 questions and correct answers percentage of total number of students is 42%. We also found that 27% (4 learners) of the learner scored at least 50% of the correct answers.

- **Post-test1 (Word Stress)**

In Post-test1, 15 learners were examined. After analyzing the data provided in Table 5.2 of the previous chapter, we found that the average correct answers by total number of learners is 17.4 out of 30 questions which show that the correct answers

percentage of a total number of students is 58%. We also found that 80% (12 learners) of the learner scored at least 50% of the correct answers.

- **Learners' Intelligibility Test for Post-test1**

In the intelligibility test for Post-test1, 15 learners were examined. Every learner's pronunciation was examined, analyzed and evaluated by Praat software.

After analyzing the data that was provided in Table 5.3 in Chapter Five, we found that the average intelligible utterance (correct syllable stress) scored by the learners is 15.2 out of 30 questions and intelligible pronunciation percentage of total number of students is 51%. We also found that 60% (9 learners) of the learner scored at least 50% of the correct answers which shows 34% improvement compare to the same score obtained by the same learners in Pre-test1.

- **Pre-test2 (Sentence Intonation)**

In Pre-test2, 15 learners were examined. Table 5.4 in the previous chapter shows every learner's obtained score (number of correct answers) along with the correct answer percentage of each learner. After analyzing the data provided in this table we found that average score of correct answers obtained by the student is 13.2 out of 30 questions which show that the correct answers percentage of total number of students is 44%.We also found that 33% (5 learners) of the learners scored at least 50% of correct answers.

- **Learners' Intelligibility Test for Pre-test2**

In the intelligibility test for Pre-test2, 15 learners were examined. Table 5.5 in the Chapter Six shows every learner's obtained score or number of intelligible utterances along with the percentage of intelligible utterances of each learner. After analyzing the data provided in this table we found that the average score obtained by the learners is 11.4 intelligible utterances out of 30 which shows that the total intelligible utterances of students is 38%. We also found that 20% (3 learners) of the learner scored at least 50% of correct answers (intelligible utterance).

- **Post-test2 (Sentence Intonation)**

In Post-test2, 15 learners were examined. Table 5.6 in the Chapter Six shows every learner's obtained score (number of correct answers) along with the correct

answer percentage of each learner. After analyzing the data provided in this table it was found that average score of correct answers obtained by the student is 14.3 out of 30 questions so the correct answers percentage of total number of students is 48%. It was also found that 53.3% (8 learners) of the learners scored at least 50% of the correct answers which is considerable compared to the same variable in pre-test 2 which was 33%(5 learners).

- **Learners' Intelligibility Test for Post-test2:**

In the intelligibility test for Post-test2, 15 learners were examined. The Table 5.7 in the previous chapter shows every learner's obtained score or number of intelligible utterances along with the percentage of the intelligible utterances of each learner. After analyzing the data provided in this table it was found that average score obtained by the learners is 13.1 intelligible utterances out of 30 utterances which show intelligible utterance percentage of total number of students is 44%. It was also found that 40% (6 learners) of the learners scored at least 50% of correct answers.

7.3. Determining the Efficiency of Proposed CALL-based Approach

In this research, the efficiency of the applied CALL based approach was measured through a detailed comparison of data between the conducted pre-tests and post-test on the subject of word stress and sentence intonation. In this research, the researcher conducted different types of test such as normal test which was conducted through paper and intelligibility test which was conducted through the computer and associated voice analyzer software (Praat) and the whole data collection was divided into two parts of word stress and sentence intonation. Hence the comparison of data are divided into the following order:

7.3.1. Analytical Comparison between Pre-test1 and Post-test1

As it was mentioned earlier, the conducted Pre-test1 and Post-test1 were about word stress. The comparison between the result of Pre-test1 which was conducted before applying the CALL method and the result of Post-test1 shows that the learners made a considerable improvement in the test that was conducted post the application of CALL based approach i.e. Post-test1.

According to the data analysis provided in Phase 1 and Phase 3 of the previous chapter, we can find that the average correct answer of the learners in Pre-test1 is 16

out of 30 questions while the average correct answers of the learners have improved to 17.4 in Post-test2. Even by calculating learners' improvement score in the form of percentage it shows that the percentage of correct answers has been raised from 46% in Pre-test1 to 58% in Post-test1 which proves that the total score of learners has been improved by 12% after being taught through CALL based approach. Moreover, the analysis of Pre-test1 shows that only 27% of the learners scored 50% of total score while in Post-test2 80% of learners reached to at least 50% of total scores.

Hence according to the above analysis of scores in Pre-test1 and Post-test1, it can be concluded that the applied CALL based method was effective and successful in helping the learners in identifying the correct stressed syllable in a word and can be used in future teaching.

7.3.2. Analytical Comparison between Learners' Intelligibility Tests for Pre-test1 and Post-test1

As it was mentioned earlier, the conducted Pre-test1 and Post-test1 were about the word stress. The comparison between the result of intelligibility tests of Pre-test1 which was conducted before applying the CALL method and the result of intelligibility test for Post-test1 shows that the learners made a considerable improvement in the intelligibility Post-test that was conducted after application of the CALL based approach.

According to the data analysis provided in Phase 2 and Phase 4 of the previous chapter, we can find that the average intelligible pronunciation of total learners in Pre-test1 is 12.6 out of 30 questions while the average correct answers of the learners have improved to 15.2 in Post-test2. Even by calculating learners' improvement score in the form of percentage it shows that the percentage of correct answers has been raised from 42% in Pre-test1 to 51% in Post-test1 which proves that the total score of learners has been improved by 9% after being taught through CALL based approach. Moreover, the analysis for intelligibility test of Pre-test1 shows that only 27% (4 learners) of the learners scored 50% of total score while in intelligibility test of Post-test1 60% (9 learners) of learners successfully achieved at least 50% of total scores which show the improvement of 33% from this point of view.

Hence according to the above analysis of scores in Pre-test1 and Post-test1, we can conclude that the applied CALL based method was effective and successful in

helping the learners in producing intelligible pronunciation with correct syllable stress.

7.3.3. Analytical Comparison between Pre-test2 and Post-test2

As it was mentioned earlier, the conducted Pre-test2 and Post-test2 (Appendix 3 and Appendix 4) were about the sentence intonation. The comparison between the result of Pre-test2 which was conducted before applying the CALL method and the result of Post-test2 shows that the learners made a slight improvement in the test that was conducted post the application of CALL based approach i.e. Post-test2.

According to the data analysis provided in Phase 5 and Phase 7 of the previous chapter, we can find that the average correct answer of the learners in Pre-test1 is 13.2 out of 30 questions while the average correct answers of the learners have improved to 14.3 in Post-test2. Even by calculating learners' improvement score in the form of percentage it shows that the percentage of correct answers has been increased from 44% in Pre-test2 to 48% in Post-test2 which proves that the total score of learners has been improved by 4% after being taught through CALL based approach. Moreover, the analysis of Pre-test1 shows that only 33% (5 learners) of the learners scored 50% of total score while in Post-test2 53.3% (8 learners) of learners reached to at least 50% of total scores which show the improvement of 33% according to this type of calculation.

Hence according to the above analysis of scores in Pre-test2 and Post-test2, we can conclude that the applied CALL based method was slightly (not considerably) effective in helping the learners in identifying the correct intonation in a sentence. The only significant improvement is about the number of learners who scored at least 50% of the correct answers which raised from 33% in Pre-test2 to 53.3% in Post-test2.

The possible reason for the weak improvement of the learner in sentence intonation with the applied CALL method could be that learning about intonation is a challenging subject for ESL learners. Therefore, learners in this study may have needed more practice and time with the help of CALL materials in order to show a significant improvement in learning it.

7.3.4. Analytical Comparison between Learners' Intelligibility Tests for Pre-test2 and Post-test2

As it was mentioned earlier, the conducted Pre-test2 and Post-test2 were about the sentence intonation. The comparison between the result of intelligibility tests of Pre-test2 which was conducted before applying the CALL method and the result of intelligibility test for Post-test2 shows that the learners made a slightly considerable improvement in the intelligibility Post-test that was conducted after application of the CALL based approach.

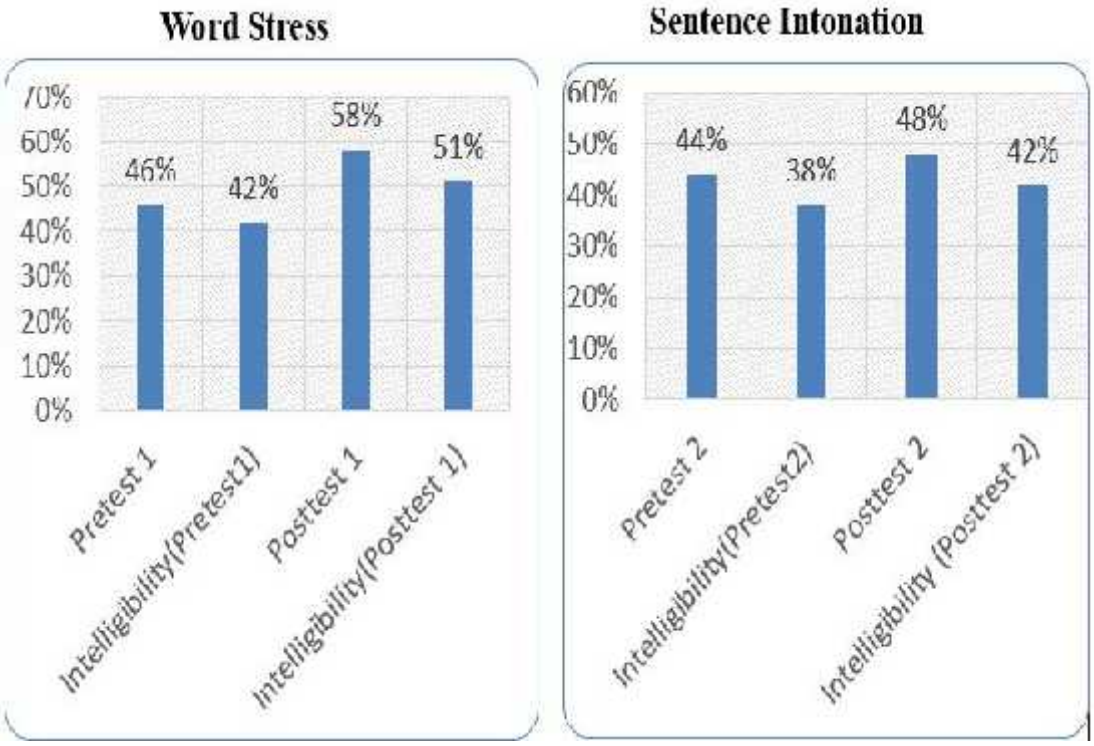
According to the data analysis provided in Phase 6 and Phase 8 of the previous chapter, we can find that the average intelligible utterance of total learners in Pre-test1 is 11.4 out of 30 questions while the average correct answers of the learners have improved to 13.1 in Post-test2. Even by calculating learners' improvement score in the form of percentage it shows that the percentage of correct answers has been raised from 38% in Pre-test1 to 44% in Post-test1 which proves that the total score of learners has been improved by 6% after being taught through CALL based approach. Moreover, the analysis for intelligibility test of Pre-test1 shows that only 20% (3 learners) of the learners scored 40% (6 learners) of total score while in intelligibility test of Post-test1 60% (9 learners) of learners successfully achieved at least 50% of total scores which show the improvement of 33% from this point of view.

Hence according to the above analysis of scores in intelligibility tests of Pre-test1 and Post-test1, we can conclude that the applied CALL based method was not considerably effective in helping the learners in producing intelligible utterance with correct intonation. As it is already mentioned, the reason for the least improvement of the learners in intelligibility tests of the learners again could be that the intonation is a challenging topic in ELT and teacher and learners should spend more time in teaching and practicing it. Hence, in this study, we may have obtained more improvement if it had been spent more time on teaching and practicing intonation using the CALL based approach.

7.4. The Whole Data Analysis at a Glance

In order to have a quick look at the whole findings and results of this research, the below figure is prepared that shows the whole data analysis and results of all conducted pre-tests and post-tests in this research.

Figure 7.1. The Entire Data Analysis for All Conducted Tests



As it is shown in Figure 7.1, the average score of total learners indicates that they had an acceptable improvement in all post-tests of both the topics of stress and intonation. A more analytical look at the above figure reveals the following conclusion points:

- The above figure shows that the learners showed improvement in all post-tests whether in stress related tests or intonation related ones.
- From the comparison of scores between the normal tests which were designed and conducted traditionally on the base of answers on paper and intelligibility tests which were carried out with the help of CALL materials, it can be concluded that the learners always performed better on paper tests (Pre-test1, Post-tet1, Pre-test2, Post-test2) compared to intelligibility tests.
- According to the above figure and the whole data analysis, it shows that the learners' performance in stress related tests was better than the intonation related tests. The following outcome indicates that the intonation topic is more challenging than word stress and it needs more practice and focus in future teaching and learning.

7.5. Limitation of the Current Study

The present study explores and investigates the efficiency of CALL-based approach in teaching English stress and intonation. Besides it also tries to identify the practice, needs, and prospects of CALL-based approach at AMU. Despite the fact that this study provides significance of mentioned above and implications of CALL method, it bears the following limitations too:

- Native Speakers (NS) of English acquire correct use of stress and intonation by birth while the Non-Native Speakers (NNS) should learn about different patterns of stress and intonation. Hence we expect a weaker result from the participants of this investigation compared to NS as they are considered as L2 learners of English or ESL learners.

- The investigation in this study is limited to teaching main stress patterns which focus on word stress (primary stressed syllable in a word) and sentence intonation patterns which focus on the two main tones i.e. falling tone and rising tone in a sentence.

- Since this study investigates the practice, need, and use of CALL-based approach for teaching and learning purposes, it requires the students and teachers to possess the basic knowledge about computer and its relevant software. Thus the current CALL method is limited to those who have the required knowledge about the computer.

- For the purpose of pronunciation intelligibility, the current study used Praat software. There are many students and teachers who don't have any knowledge about using this software. Therefore, before applying the CALL-based approach, the students and teachers must learn about using this software for analyzing voice or pronunciation then the intelligibility of pronunciation can be monitored and improved.

- The duration of data analysis and the application of method was done in four days which signifies that the application of CALL method and administration of all pre-tests and post-tests of stress and intonation was conducted in a very compact schedule; therefore there is possibility of a better results on the

efficiency of the applied CALL method if it is conducted in a longer and more regular schedule.

- Since there was no access to a native speaker at AMU, online-based resources such as the internet, YouTube, and Text-To-Speech machines were used for demonstration of a native-based pronunciation.

7.6. Recommendations / Suggestions of the Study

As it was already mentioned, the following study was about teaching stress and intonation to improve intelligibility with the help of CALL based approach. According to the data that was analyzed in the previous chapter, we can conclude that applied CALL method was found effective in teaching the B.A final students of Aligarh Muslim University.

As the learners in this study showed an improvement in all post-tests in a span of several days of teaching activities with the help of CALL based materials and approaches, we may suggest that teaching with the help of CALL based methods in future would be more effective with the following recommendations:

- It is recommended that we should spend more time and practice while teaching the students with CALL method.
- The students should spend a short course in learning about using Personal Computers (PC) and its related software for pronunciation enhancement purpose.
- Since the native speakers are the best people who can use stress and intonation patterns accurately, it is recommended to use a native speaker of English while teaching about stress and intonation for providing a better teaching and listening experience for students.
- The learners in this research were not all at the same level. Hence it is recommended that before applying the CALL-based approach of teaching, they should undergo a level assessment test to divide them into different levels such as beginners, intermediates, or advanced level.
- Since the subjects of stress and intonation are rather oral-based skills and could be challenging for many ESL or EFL students who spend most of their learning

time in enhancing grammar, vocabulary or written communication skills, hence, it is recommended that the students should take an oral communication course in English with focus on prosodic features of English language such as stress, intonation, rhythm, etc.

- It is recommended to conduct remedial classes for those learners who are not gathering the same speed in learning about stress and intonation. If a student seems to be significantly behind the expected level for the class, the teacher can require him or her to take a remedial class. These classes can bring up the struggling students, allowing them to work at a more appropriate level, rather than getting weak results because they are not at the same level as the rest of the class. Remedial classes can provide a helpful environment for those students suffering from low self-esteem, as they encourage the students to ask as many questions as needed to comprehend a subject, rather than feeling stressed to learn everything immediately.

- Since a learner may not have physical access to native speakers who are best in using proper stress and intonation, s/he can use internet based resources to listen, practice and enhance the intelligibility of his/her pronunciation.

  Some of these online resources are as follows:

  - Longman Dictionary of Contemporary English Online:

    This online dictionary is available on its internet website at www.ldoceonline.com. This dictionary is an ideal online tool for checking pronunciation accuracy and it shows the correct stressed syllable as well as syllable division for any English word.

  - Oddcast Online Text to Speech Machine:

    The Oddcast Text to Speech machine is accessible through www.oddcast.com. This text-to-speech machine is capable of pronouncing different word or sentences with correct stress and intonation. It provides natural human voice pronunciation with different English accents such as American or British.

- It is recommended to conduct Terminal Language Behavioral Test (TLBT) among the learners of this research in order to acquire more accurate data while collecting and analyzing data for this study.

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Appendix

Appendix - 1

Pre-test
Please Choose the primary stressed syllable in following words.

1. Conservative
   Con
   Ser
   Va
   Tive
2. Negative
   Ne
   Ga
   Tive
3. Sensitive
   Sen
   Si
   Tive
4. Efficient
   E
   Ffi
   Cient
5. Sufficiency
   Su
   Ffi
   Cien
   Cy
6. Gorgeous
   Gor
   Geous
7. Electrician
   E
   Lec
   Tri
   Cian
8. Iranian
   I
   Ra
   Nian
9. Memorial
   Me
   Mo
   Rial
10. Islamic
    Is
    La
    Mic
11. Practical
    Prac
    Ti
    Cal
12. Confident
    Con
    Fi
    Dent
13. Regional
    Re
    Gio
    Nal
14. Relation
    Re
    La
    Tion
15. Reputation
    Re
    Pu
    Ta
    Tion
16. Gratitude
    Gra
    Ti
    Tude

17. Ability
    A
    Bi
    Li
    Ty
18. Clarity
    Cla
    Ri
    Ty
19. Offensive
    Of
    Fen
    Sive
20. Eventual
    E
    Ven
    Tu
    Al
21. Binoculars
    Bi
    No
    Cu
    Lars
22. Spacious
    Spa
    Cious
23. Spontaneous
    Spon
    Ta
    Neous
24. Afterwards
    Af
    Ter
    Wards
25. book-store
    Book
    Store
26. suspect(n)
    Sus
    Pect
27. Abuse
    Ab
    Use
28. Recommended
    Re
    Co
    Mmen
    Ded
29. Neighborhood
    Neigh
    Bor
    Hood

30. Advantage
    Ad
    Van
    Tage

Appendix - 2

Post-test

Choose the primary stressed syllable in following words.

1. Alternative
   Al
   Ter
   Na
   Tive
2. Relative
   Re
   La
   Tive
3. Native
   Na
   Tive
4. Cognitive
   Cog
   Ni
   Tive
5. Ancient
   An
   Cient
6. Proficiency
   Pro
   Fi
   Cien
   Cy
7. Courageous
   Cou
   Ra
   Geous
8. Technician,
   Tech
   Ni
   Cian
9. Guardian,
   Guard
   Ian
10. Official
    Of
    Fi
    Ci
    Al
11. Catastrophic
    Ca
    Tas
    Tro
    Phic
12. Medical
    Me
    Di
    Cal
13. Accident,
    Ac
    Ci
    Dent
14. Rational
    Ra
    Tio
    Nal
15. Criminal
    Cri
    Mi
    Nal
16. Nation
    Na
    Tion

17. Altitude
    Al
    Ti
    Tude
18. Solitude
    So
    Li
    tude
19. Productive
    Pro
    Duc
    Tive
20. Cognitive
    Cog
    Ni
    Tive
21. Conceptual
    Con
    Cep
    Tu
    Al
22. Individual
    In
    Di
    Vi
    Dual

23. Muscular
    Mus
    Cu
    Lar
24. Precious,
    Pre
    Cious
25. Downwards,
    Down
    Wards
26. Footprint
    Foot
    Print
27. present(v)
    Pre
    Sent
28. Abroad
    Ab
    Road
29. Surprising
    Surp
    Ri
    Sing
30. Composes
    Com
    Po
    Ses

Appendix – 3

Pre-test

Please choose the correct tone in the following Sentences.

1- You are moving ?(expressing either positive or negative reply)
   Rising
   Falling
2- You didn't sleep last night? (expressing either positive or negative reply)
   Rising
   Falling
3- What is his name?(Implication)
   Rising
   Falling
4- What is his name ?(special question)
   Rising
   Falling
5- Where does he live? (Implication)
   Rising
   Falling
6- Betty Lives in London.(Ordinary statement)
   Rising
   Falling
7- He has got a dog?(Question)
   Rising
   Falling
8- I have not read this Book.(Ordinary statement)
   Rising
   Falling
9- You haven't read this book?(Question)
   Rising
   Falling
10- Do you visit him often?(General question)
   Rising
   Falling
11- Do you find English difficult? (General question)
   Rising
   Falling

12- Have you seen my keys?(Non-polarity type question)
   Rising
   Falling

13- It’s a beautiful town, isn’t it?(expecting positive response)
Rising
Falling
14- She is from India, isn’t she? (Expecting either positive or negative response)
Rising
Falling
15- She knows him, doesn’t she?(expecting positive response)
Rising
Falling
16- She knows him, doesn’t she? (Expecting either positive or negative response)
Rising
Falling
17- Do you want coffee or tea?(Alternative)
Rising and Falling
Falling and Rising
18- Do you speak English or German?(Alternative)
Rising and Falling
Falling and Rising
19- Sit down.(command)
Rising
Falling
20- Close your books.(command)
Rising
Falling
21- What a wonderful present!(exclamation)
Rising
Falling
22- How nice of you!(exclamation)
Rising
Falling
23- She bought bread, cheese, oranges and apples.(enumerating)
Rising, Rising, Rising and Falling
Falling, Rising, Rising and Falling
Rising, Rising, Rising and Rising
Falling, Falling, Falling and Falling
24-All of a sudden, the girl started to cry. (introductory phrase)
Rising-Falling
Falling-Rising
Rising-Rising
Falling-Falling

25- According to my knowledge, he is a chemist. (introductory phrase)
Rising-Falling
Falling-Rising
Rising-Rising
Falling-Falling

26- They are Swedish, aren't they?(expecting either positive or negative reply)
Rising-Falling
Falling-Rising
Rising-Rising
Falling-Falling

27- Well, I'm not sure what all these mean.(introductory phrase)
Rising-Falling
Falling-Rising
Rising-Rising
Falling-Falling

28- That's amazing(exclamation)
Rising-Falling
Falling-Rising
Rising-Rising
Falling-Falling

29- Are you serious?(Question)
Falling
Rising

30- One, two, three, four. (Enumerating)
Rising, Falling and Falling
Rising, Falling and Rising
Rising, Rising and Falling
Rising, Rising, and Rising

Appendix – 4

Post-test

Please read the following sentences with correct tone then tick the correct answer accordingly

1. You know what I'm talking about, don't you? (Expecting positive reply)
   Rising
   Falling
2. Is he married?(Expressing uncertainty)
   Rising
   Falling
3. You've got the keys, haven't you? (Expecting positive reply)
   Rising
   Falling
4. You've got the keys, haven't you? (Expressing uncertainty)
   Rising
   Falling
5. Where is he from ?(Implication)
   Rising
   Falling
6. Where is he from? (Special question)
   Rising
   Falling
7. What is his name?(Implication)
   Rising
   Falling
8. When did you call him?(Special question)
   Rising
   Falling
9. He has bought a new car (Ordinary statement)
   Rising
   Falling
10. He has bought a new car ?(Question)
    Rising
    Falling
11. Do you like Indian food? (General question)
    Rising
    Falling
12. Could you give me a pen please?(General question)
    Rising
    Falling
13. You know what I am talking about, don't you?(Expecting positive reply)
    Rising
    Falling
14. He is living in Aligarh, isn't he ?(Expecting either positive or negative reply)
    Rising
    Falling

15. Ayesha speaks German, isn't she? (Expecting either positive or negative reply)
    Rising
    Falling

16. It's a beautiful town, isn't it? (Expecting positive reply)
    Rising
    Falling

17. Do you like Delhi or Mumbai?(Alternative question)
    Rising and Falling
    Falling and Rising
    Rising and Rising
    Falling and Falling

18. Is it black or grey? (Alternative question)
    Rising and Falling
    Falling and Rising
    Rising and Rising
    Falling and Falling

19. Stop it. (Command)
    Rising
    Falling
20. Turn off the light. (Command)
    Rising
    Falling
21. What a beautiful peacock! (Exclamation)
    Rising
    Falling
22. Happy birthday Mohammed!(Exclamation)
    Falling
    Rising
23. The old lady had a goat, a dog and a cow(Enumerating sentences)
    Rising, Falling and Falling
    Rising, Falling and Rising
    Rising, Rising and Falling
    Rising, Rising, Rising
24. I have been to India, France, England and United States(Enumerating sentences)
    Rising, Falling, Falling and Falling
    Rising, Falling, Rising and Rising
    Rising, Rising, Rising and Falling
25. They are our new neighbor, aren't they? (Expressing doubt)
    Rising and Falling
    Falling and Rising
    Rising and Rising
    Falling and Falling

26. On the other hand, it’s a big festival(Introductory sentence)
    - Rising and Falling
    - Falling and Rising
    - Rising and Rising
    - Falling and Falling
27. Actually, she wasn’t prepared for the exam. (Introductory sentence)
    - Rising and Falling
    - Falling and Rising
    - Rising and Rising
    - Falling and Falling
28. Do I know you? (Non-polarity type question)
    - Rising
    - Falling
29. Do you speak Arabic?(question)
    - Rising
    - Falling
30. Where are you going?(question)
    - Rising
    - Falling

October 4, 2015

Dear Sir or Madam:

This letter grants permission to Khaled Kordi Tamandani to use my public ESL language instructional videos hosted on YouTube in his work as a PhD researcher within the Department of English at Aligarh Muslim University, India. I understand that he will use excerpts as samples of native English speech.

Best regards,

Jennifer Lebedev
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Assessing Non-native Speaker's Intelligibility in Lexical Stress through Praat Software

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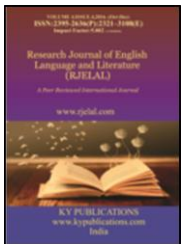

ABSTRACT

English is considered as one of the most widely spoken and recognizable languages in the world. It has become a part of the cultural and social education of many countries and communities. The use of computer software has become a new platform for learning different English Language skills such as reading, listening, writing, and speaking. When it comes to speaking, we always know that correct pronunciation and being intelligible for other listeners is an important factor. Word stress is considered as a prosodic feature of English in which the correct use of it can help the English learner in a better understanding of English language, vocabulary build up, and accent reduction. Using proper word stress can help a non-native English learner to sound more intelligible while speaking. For assessing a non-native speaker's intelligibility in using word stress, Praat voice analyzer software can be used. Praat is a free scientific computer software for the analysis of speech in phonetics. It can analyze human voice in different forms such as; waveform analyses, spectrogram analysis, pitch analysis and, etc. Praat is one the most useful voice analyzer software that is used by many linguists for different research purposes.

Keywords: Intelligibility, Stress, Praat, Non-Native Speakers

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1. INTRODUCTION

English is the most spoken native language in the world, and regarding its real number of speakers, it is globally the most spoken official language, and it is the primary language used in any international affairs.The English language is officially accepted even in those nations or countries where it is not primarily being used as spoken language. It is indisputably the primary language of global trade and commerce.

The teaching of pronunciation has faced drastic change over the history of English language teaching and learning. It was one of the most neglected aspects in English, and it has got more attention with the past half of the twentieth century with the invention of audio-lingual devices. Throughout history, teachers and linguists have attempted to overcome the difficulty of teaching this skill. In this respect, they have tried to develop various methods and techniques with other related sub-disciplines such as phonetics, phonology, and second language acquisition among others.

Pronunciation is generally defined as "the manner in which speech sounds, especially connected sequences are articulated by individual speakers or by speakers generally" (Trask, 1996, p. 21). Taking it to consideration, pronunciation is closely linked to the study of phonetics which involves the scientific study and description of speech sounds. According to Pennington & Richards (1986), pronunciation can be defined as "articulation of individual sounds and, to a lesser extent, with the stress and intonation patterns of the target language" (p. 32).

2. The Importance of Learning Stress for Second Language Learners of English

Murphy (2004), says that focusing on word stress helps the learners in learning vocabulary. After presenting a numeric system to classify stress patterns in English to two ESL classes, he questioned his students to get feedback about his tutorial methods. The numeric system that he designed only provided information to the student for considering the number of syllables in a word to guess which syllable of the word would get the stress. However this system is minimal and does not merely specify rules of thumb, but it still recommends that students can take advantage of it, since 25% clearly accepted that "applying the numeric system assisted them in learning new words pronunciation", and "to learn about using new words in conversation" (36%).

In Tremblay (2008), it is also advised that more advanced learners can use word stress to identify words. Although the linking is not instant, this does suggest that there is a connection between instruction and word stress processing. Tremblay says that "knowing where the primary stress is placed in English words is not enough for L2 learners to be capable of using stress for L2 lexical access" (p. 353). With respect to Anderson's Active Control of Thought (ACT), before automatizing the process, first, there must be a perceptive stage and an associative stage, both of which may be facilitated through a metalinguistic understanding of stress.

3. The Importance of Stress in Pronunciation Intelligibility

Speaking and understanding English does not come only from using correct grammar and vocabulary, Native English speakers convey meaning in their sentences with correct stress and intonation, i.e., the ups and downs and musical notes of their sentences. Stress is a vital part and also a complicated aspect of communication, and mostly they are counted as the unconscious mechanisms among the native speakers. Stress belongs to suprasegmental aspect of English pronunciation. On the other hand, stress is the loudness or emphasis on a certain syllable in a multisyllabic word in which the pitch of the voice rises and falls throughout an utterance that in result it creates melody or intonation contour.

Lexical stress is about how to pronounce a word rather than what to say. In English like many other languages, stress has a grammatical effect on the different type of phrases or sentences and can distinguish them from each other. Native speakers can speak with proper lexical stress naturally and intelligibly, but as a second language or foreign language learner, it is mostly difficult to follow the correct stress patterns. Lexical stress focuses on the essential elements of spoken messages, and it also helps in improving communicational interaction. Proper use of lexical stress can help a learner to sound more intelligible.

Altogether, in English language teaching, stress is communicatively necessary, but they are notoriously difficult to be learned by second language learners.

4. Computer Assisted Language Learning (CALL) and its Effectiveness on Pronunciation Intelligibility Enhancement.

There has been a massive development of user-friendly computers and software and also a rapid reduction in their prices in the last decade. Nowadays computers are present in almost every home, office, and school. In the current century, a computer is a vital need for everyone to use it to some extent to function in the society. In several countries of the world, in the educational context, audio language labs are being replaced by computer centers or computer labs equipped with internet connection facility.

Computer Assisted Language Learning (CALL) is an approach to teaching and learning in which the computer or computer-based resources such as software or the Internet are used to present,

reinforce and evaluate the materials which have to be learned. It includes a substantial interactive element. Using CALL also involves the search for and the investigation of applications in language teaching and learning. CALL is also known by several other terms such as technology-enhanced language learning, computer-assisted language instruction, and computer-aided language learning.

Considering the use of computers in language teaching and learning, it has been several years that teachers and researchers have been testing, using and developing ways to use computers in their teaching methods since computer devices have been available for most of the students. With the fast development of computers in our daily life, we also started using computers in our classroom.Language teachers can assist the development of learners' language acquisition by using computer-assisted language learning (CALL) in current teaching context.

With the help of computers, the students can have access to many software and internet based resources for which they can improve their pronunciation intelligibility. Using computers provides access to many online or offline video lessons, dictionaries, podcasts, English learning software, and online language labs.

With having access to all mentioned above material with the help of computers the learners can significantly improve their pronunciation intelligibility.

Although the scope of CALL has been extended in recent years, it is still not a perfect and complete method for teaching or learning all aspects in a language. The quality of programs has not yet acquired the level of evaluating the users' natural spoken language or its usage appropriateness in the context above.

5. Praat Software as a CALL Tool

Praat (the Dutch word for "talk" or "speak") is a free scientific computer software for the analysis of speech in phonetics. It was programmed and continues to be developed, by Paul Boersma and David Weenink. This software also supports speech synthesis, including articulatory synthesis.Praat is one of the most commonly used programs for the purpose of speech analysis among linguists. Boersma & Weenink (2015).

In this paper, we will introduce a method for analyzing and differentiating an intelligible utterance from an unintelligible one and how to enhance the intelligibility of pronunciation in word stress and sentence intonation.

6. Assessing Intelligibility of Pronunciation in Word Stress.

As we have already mentioned, the native speakers of English acquire the skill for pronouncing the words and sentences with correct stress and intonation naturally and by birth; so a native speaker's pronunciation is an ideal sample for assessing a non-native speaker or an ESL learner s' pronunciation

The figure below shows a sample voice analysis done by Praat software in which the tri-syllabic word "confident" uttered by the native speaker.

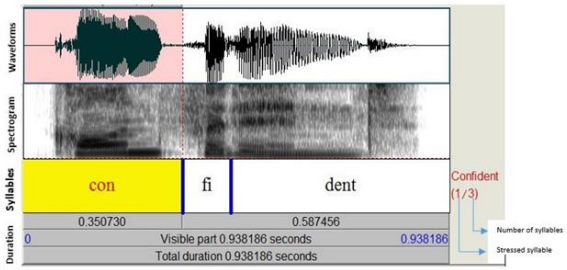

Figure 1: Sample of an Intelligible Digital Voice Analysis for Word Stress

As it is shown in Figure1, the digital analysis done by Praat software consists of 3 parts.The first section shows the vocal analysis of the word by relative waveforms, the second row displays the intensity of voice by showing the spectrogram analysis of the pronounced word, and the third row shows the divided syllables of the word. Beneath the row that shows syllables of the word, the time duration of each syllable and the total length of utterance for the word is mentioned.

In this example the word "confident" consists of three syllables; "con", "fi", and "dent". In Figure 1, the syllable section shows that the stressed syllable "con" is highlighted from other syllables. In this figure, The two arrows on the lower right-hand side signify that the digit "3" means the total

number of syllables in the word and the digit "1" means that the first syllable gets the primary stress.

The first row in Figure 1 displays the sound waveform of the pronounced word. The waveform analysis in this figure shows more wave density on the first syllable which indicates that the first syllable gets the main stress.

The second row in Figure 1 displays the spectrogram of the pronounced word. The spectrogram analysis that is shown in the second section of this figure indicates the higher intensity of voice in the pronunciation of the first syllable("con") which caused the left part of the spectrogram bar to get darker than the other regions and it signifies that the primary stress is fallen on the first syllable.

7. Assessing Non-native Speaker's Intelligibility of Pronunciation in Word Stress.

The comparative figure below shows the difference between an intelligible word stress pronounced by a native speaker and an unintelligible word stress pronounced by a non-native speaker.

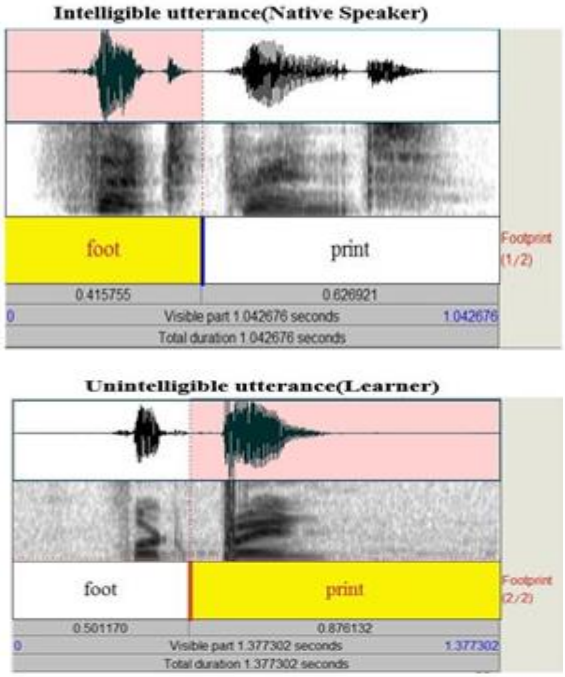

Figure 2: Intelligibility Analysis of Word Stress Done by Praat Software

As it is shown in the above figure, the intelligibility of a non-native speaker's utterance is determined by comparing its digital analysis with the native speaker's utterance. This figure shows the digital analysis of Praat software for the word "footprint" which is uttered by both the native speaker (left part of the figure) and non-native speaker or learner. (right part of the figure).

The digital analysis of native speaker's utterance shows that there is a significant waveforms density and voice intensity on the location of the first syllable of the word which shows that the native speaker intelligibly pronounced the word with correct stress.

The digital analysis of learner's utterance shows that the waveforms density and voice intensity is incorrectly fallen on the second syllable of the word which shows that the learner's utterance is not intelligible according to the software pronounced the word with correct stress.

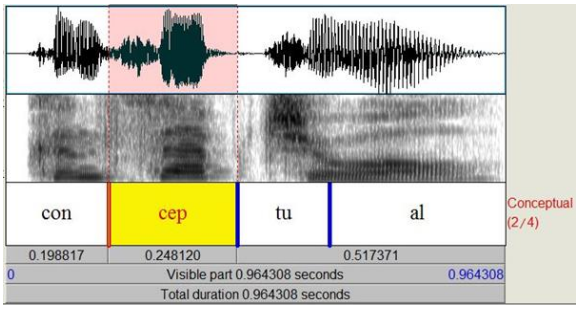

Figure 3: Native Speaker's Intelligibility Analysis for the Word "Conceptual"

Figure 3 shows the native speaker's voice analysis for the word "conceptual". As per the analysis provided in this figure we can observe that this word contains four syllables, and according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the primary stress is fallen on the second syllable ("*cep*") as there are visible higher waveforms on the area of this syllable.

Figure 4 depicts the non-native speaker's voice analysis for the word i.e. "conceptual". The analysis provided in this figure shows that the waveforms on the area of second syllable("cep") are longer and there is more density of waves on it compare to other syllables. Furthermore, the spectrogram analysis of the figure slightly shows more voice intensity on the location of second syllable *("cep").*

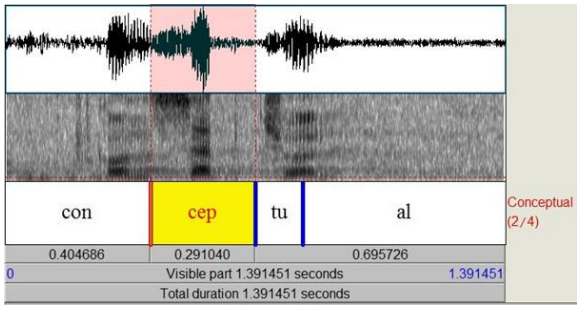

Figure 4: Non-Native speaker's Intelligibility Analysis for the Word "Conceptual"

By comparing this figure with Figure 3 where the same word is pronounced by the native speaker, we can observe a similar waveforms and voice intensity throughout the pronunciation of the word . Hence we can conclude that the non-native speaker successfully managed to produce an intelligible pronunciation for this word the second syllable more stress than the other syllable.

Hence we consider non-native speaker's pronunciation as an intelligible one. Although both the figures accurately show the stressed syllable but, the digital analysis in Figure 3 (native speaker's pronunciation) shows that the waveforms are longer and higher and the intensity of voice in spectrogram section is visibly stronger compare to Figure 4 (non-native speaker's pronunciation)

8. Conclusion

According to the digital sound analysis that are shown in different figures of this paper, we can conclude that Praat software is quite useful for a non-native speaker for enhancing and assessing intelligibility of their pronunciation by constant comparison with native speaker's pronunciation.

While analyzing Non-native speakers' pronunciation with Praat software, the software may show that their intelligibility level is not at same level as the native speakers, but with the help of Praat software, they can monitor and improve the intelligibility of their pronunciation to acquire similar intelligibility level to a native speaker.

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Using E-learning Techniques and Tools for Enhancing Main English Language Skills

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Abstract: English is one of the most widely spoken and recognizable languages. It has become a part of the cultural and social upbringing of many communities. The use of E- learning techniques has become a new platform for learning different English Language skills such as reading, listening, writing, and speaking. These skills are the most important factors which lead to a better understanding of English language, vocabulary build up and accent reduction which in-turn effects the language of a person. Various E-learning techniques like online or offline dictionary software, Internet-based materials, and websites, YouTube and Podcast have played a crucial role in improving and learning English Language skills of non-native learners. This paper deals with the incorporation of these techniques for the effective use in acquiring, enhancing, and improving these main English language skills.

Keywords: E-Learning, Internet, MALL, English Language Skills, Dictionary, Computer, Software.

1. Introduction

Use of computers and innovative technologies has become an essential part of learning and teaching process. E-learning today has been an important factor in many industries and teaching is one of them; especially teaching languages. E-learning has introduced some approaches and notions of teaching that have made the teachers and learners to implement better and effective in teaching and learning a language. The following paper will talk about how different e-learning tools can affect various skills in learning the English language.

The English language is leading and the most in use language in the world and in terms of its pure number of speakers, it is globally the most spoken official language and it is the primary language used in any international affairs. This emerges an essential need for learning English. With learning English language, one is capable of using it in several contexts such as communication with other people in the world, to be able in using and having access to billions of information resources. There are many varieties of English language such as historical, social, cultural and regional variations. English is the fourth most spoken native language in the world, The English language is officially accepted even in those nations or countries where it is not primarily being used as spoken language. It is certainly the main language of international trade and business.

2. The status of E-learning in Education

We are living in a world where technology is omnipresent. Due to the omnipresent presence of technology the methods of teaching has also experienced a sea-change. "e-Learning" or "Technology in Education" has become the center of attention in every educational system. Including technology into education is very important as it provides the requirements of the modern-day learners. The style of today classrooms is completely different from the old-style classroom. The old-style approaches which are mainly based on lecturing and repetition technique learning, reduce English language learning to mechanical memorization and unfortunately fail in developing the English language as a skill among the learners. Recent technologies such as Internet, Skype, YouTube, blogs, Twitter, mobile phones, interactive boards and many more have added not only stimulus but also learners' engagement in a proper way

3. E-learning Techniques and Tools in Teaching and Learning English

Nowadays learning and teaching English has become easy and interesting with the help of electronic devices and online tools such as computers, mobiles, tablets and social networks such as Blog, Twitter, Facebook, Skype, etc. Online instruction stimulates the process of language learning. It is widely known that language learning is conducted by different skills such as speaking, listening, reading, and writing for correct usage so that proper meaning is given to the words and sentences used. Technology is adapted for learning and teaching purposes, to meet the demands of man and enable him to attain the imperishable and flawless treasure of learning.

Here we introduce some E-learning tools and materials for effective English language learning language which can be in the form of computer software, Educational CDs, internet based software, and websites.

4. Objectives

The objectives of the present study were as follows:

a) To find out the EFL teachers' perceptions to action research
b) To investigate the practices and problems of conducting action research in an EFL context

5. Significance of the Study

Teachers should be able to construct their own theories of practice according to the particular context of their classroom, particular students and socio-cultural environment (Kumaravadivelu, 2001). Furthermore, teachers should become more than consumers of theories and research, they should become researchers and theorists in their own right (Ellis, 1997).But, it is still not clear whether the practice of action research is widespread among EFL teachers in Nepal. Do EFL teachers really conduct action research? If not, what are the problems of conducting action research? This study tries to find out the perceptions, practices and problems of conducting action research in an EFL context of Nepal. I suppose, this study will provide teachers and teacher trainers with a wider repertoire of responses to be considered as they re-evaluate and reflect on their own instructional practices. It will be equally important for course designers, material producers (text book writers, training manual developers etc.) and all other professionals directly or indirectly involved in ELT including the researchers in the field of

reflective practices.

A. Longman Dictionary of Contemporary English (LDOCE), 5th Version

Longman Dictionary of Contemporary English (LDOCE) is an exciting tool which combines a computer database with sound and picture. The user has the access to different kinds of information available on the database about grammar, meanings of words, pronunciation etc. It is provided with real life examples, photographs, etc. This tool helps the learner to understand and learn the structural form of a language and also provides many interactive exercises. (Longman Interactive English Dictionary)

Longman Dictionary of Contemporary English (LDOCE) was first published by Longman in 1978. The dictionary is now available in various formats: paper only; paper with a bundled premium website; software for Personal Computers(PC); online access only or a cost-free online version. LDOCE is an advanced learner's dictionary, providing over 230,000 words, meanings, and phrases by using a controlled and restricted vocabulary that helps non-native English learners to understand meanings of words easily. ("Longman dictionary of contemporary English," n.d.)

LDOCE software can be used as one of the efficient E- learning tools for English language learners. In this paper, we are going to discuss on LDOCE software 5th version designed for different versions of Microsoft Windows such as Windows XP, Windows 7, Windows 8 and Windows 10 as a software that can be used as an E-learning tool for enhancement of grammar. The following software has a very interactive and easy user interface which makes the learner capable of using it at most efficient way possible.

The LDOCE software 5th version which can be used as an E-learning tool, can provide many key learning features to the English learners which some of them may be briefly stated as follows:

a. Word pronunciation: The LDOCE software contains very clear human voice word Pronunciation both in American English and British English which helps the learner to acquire the best pronunciation experience.

b. Syllable division and phonetic transcription: this dictionary provides the syllable division of the words as well as showing stressed syllable by marking a "□" symbol on the beginning of the stressed syllable. Like many other dictionaries, LDOCE provides the phonetics transcription of every word. This feature of LDOCE will help the learners to have a better understanding of how the pronunciation of the words should be made.

c. Well-defined words definition: the LDOCE provides the learners a very well definition of words by giving a clear explanation of the word meaning along with several examples, word family, word origin and in the case of verbs, the different forms of the verb is also provided.

d. Grammar lessons: LDOCE contains several grammar lessons which deal with main grammar rules such as; statements and questions, verbs, present tense, past tense, future tense, phrasal verbs, modal verbs, conditionals sentences, active and passive, nouns (countable and uncountable), nouns(singular and plural), determiners and

articles, word order, comparison reported speech. The grammar lessons are well organized and well explained and numerous examples are given which shows their context of use in different skills of language learning.

e. Exercises: The LDOCE contains a large bank of exercises for English learners to practice English. There are diverse types of exercises provided in LDOCE software which makes it very helpful for the learner to test his/her skills in language learning. This software provides the user with exercises that are categorized under different sections such as; grammar, vocabulary, synonym, collocation, listening and pronunciation and exam practice(IELTS,TOEFL, CAE, CPE, FCE)

f. Vocabulary trainer: The Vocabulary Trainer allows the learner to learn and revise useful topic, academic or general vocabulary. The program will ask a series of questions about the meaning of a word, grammar, collocations, spelling, and pronunciation. By answering all of these questions correctly, the learner will show that he/she not only understand a word but can also use it in context.

The latest version of Longman Dictionary of Contemporary English is the sixth edition. The premium website was revised during 2014 and 2015 and offers over million corpus examples, exceeding that of the paper version and also supplying sound files for every word and 88,000 example sentences, along with various tools for study, teaching, examinations and grammar. The 9000 most important English words to learn have been highlighted via the Longman Communication 9000.

B. Internet-based E-learning Materials

The Internet is not really a source of reliable material in English but it can be relied as a source of information in various types such as; articles, books, courses, conferences, etc. The learners can send or receive assignments through e-mails and can also participate in online exams. Teachers can view their students' work online at any time. Learners will not miss their lessons as they can see and listen to the teacher through an online webcam and receive tests, quizzes, and notes from electronic online whiteboards. Schools are interconnected in a network and they do the projects together and prepare materials online. Every school or university has its own website. There are numerous free internet-based software and websites also available on the Internet that learners can use them as E-learning tools and enhance their English language skills.

C. YouTube

YouTube is a world-wide video-sharing website headquartered in San Bruno, California, United States. The service was founded by three former PayPal employees in February 2005. In November 2006, it was bought by Google for US$1.65 billion (Hopkins, 2006). YouTube now is one of Google's subsidiaries. (The Associated Press, 2006). The site allows users to upload, view, rate, share, and comment on videos. Available content includes video clips, TV clips, music videos, movie trailers, and other content such as video blogging, short original videos, and educational videos. Most of the content on YouTube has been created and uploaded by individuals, but media companies including CBS, the BBC, Vevo, Hulu, and other organizations provide some of their material via YouTube, as part of the YouTube partnership program. (Weber, 2007)

YouTube is a massive source of information for different purposes. For an English language learner, YouTube videos can be adopted as an e-learning tool in an ELT classroom for many aspects of English as for enhancing vocabulary, accent reduction, improving pronunciation intelligibility, voice modulation, etc. YouTube can be effectively used in English language teaching as it offers authentic examples of routine English used by routine people. The teacher can use it as an e-learning tool for enhancing their Listening, Speaking, Reading and Writing skills. The teacher can choose a part of the movie that is suitable to the level of the learners and she/he can use those movie clippings as appropriate teaching material, for instance, the teacher can arrange worksheets on the movie clippings in advance and ask the learners to complete those worksheets while watching movies. This can demonstrate a worthy activity to improve their listening and writing skills.

D. Skype

Skype is an application that provides video chat and voice call services. Users may exchange such digital documents as images, text, video, and any others, and may transmit both text and video messages. Skype allows the creation of video conference calls which makes it as an effective e-learning tool for teaching and learning the English language. Skype is available for Microsoft Windows, Macintosh, or Linux, as well as Android, Blackberry, and both Apple and Windows smartphones and tablets.(Markton, 2014)

Using Skype delivers limitless potentials for the teachers and learners to cooperate with each other anywhere in the world. It offers considerable opportunities for the learners in a foreign language class to connect with classes in other countries to practice and improve their language skills. Through Skype, the teachers can provide the learners mentoring or homework help. The Students can read, present, or perform for other students and also collaborate with other students on writing or research projects. They can also participate in professional development activities within or outside the school district.

E. Smart-boards

Interactive whiteboards are good replacements for old-style whiteboards as they offer several ways to show students everything which can be showed on a computer's desktop (educational software, web sites, and others). SMART boards help teachers in conducting a student-centered class to teach different language skills. Teachers can use SMART Boards to improve learners' reading and comprehension, and teach grammar and writing. With a SMART Board, teachers can combine video, audio, Web browsing and word processing to teach students interactively. The teacher can use smart board to improve students' language skills in play way method. For e.g. 'Pictogram' (Draw a picture and guess the word) can be played. With younger learners, spelling races are very popular. Word games are an effective way for classroom activities and studying vocabulary. She/he can use jumbled sentences for the Learners or she/he can also ask the synonyms or antonyms or the lexis or collocation words. The teacher can use different colors when writing. For eg., While teaching grammar the teacher can use the Blue color pen for the nouns, the Yellow color for the verbs, the Red color for the adjectives and the Green color adverbs. For e.g.: The young (Red Color) boy (BLUE) jumped (Yellow Color) from the tall (Red Color) tree (Blue Color) quickly (Green Color). The teacher can also display paragraphs with errors and ask the stu-

dents to edit the paragraphs or proofread them. To teach writing skills the teacher can also use a story starter and ask the students to write a class story or chain story or peer story. S/he can also write sentences based on photographs as it will teach them the usage and functions of the language. S/he can further use photographs of persons (i.e. characters from book, persons from history) and can ask the students to write in "bubble" about their thoughts. (Chhabra, 2012)

F. Mobile Assisted Language Learning (MALL)

Mobile-assisted language learning (MALL) is language learning that is assisted or enhanced through the use of a handheld mobile device (Chinnery, 2006) Shield L. & Kukulska(2008). As a Technological Tool MALL is a branch of technology-enhanced learning in English which can be implemented in many forms including face-to-face or on-line modes. Students could learn grammar through mobile phones using short text messages and websites, which are developed to explain sentence structure and English idioms. Despite being a phone, a smartphone is capable of doing various tasks like browsing through online web pages or playing online or offline video and audio clips which all can be used in English language learning. Hence it can be used as an ideal portable audio-visual aid for learners.

Mobile devices help learners have a better involvement in learning different English Language skills and to have a better interaction. The use of mobile phone as a learning tool is widely used in educational systems. Mobile Phone is considered as a miniature of a computer. MALL consists of short lessons of grammar, vocabulary lessons, dictionary, and recorded lectures for better understanding and language learning games. The advantages of using mobile phones as a tool for language learning are promoted social interactivity among students, enhances individual learning by referring to recorded lectures and easy accessibility which enable learners to learn a language outside classroom settings.

G. Video Language Lessons

Video Language Lessons help speed learning and developing grammar skills through listening. Many types of software are used to make grammar learning effective and interesting. They offer lessons on active and passive voice, direct and indirect speech, parts of speech, use of tenses, kinds of sentences and patterns, to enhance interest among the teens to learn grammar.

H. Podcasts

A podcast is a periodic series of digital media files that a user can prepare and the new episodes can be downloaded automatically through web syndication to the user's personal computer or portable media player. (Merriam-Webster, 2015) . The word is taken from the combination of "iPod" (a brand of media player) and "broadcast." Hence the uploaded files are usually audio or video, but they may be created in other file formats such as PDF.

Podcasting, previously recognized as "audio blogging", has its origin dating back to the 1980s. With the invention of internet and digital audio devices such as the iPod, podcasting began to catch hold in late

2004.(Hammersley, 2004). Today there are numerous English-language podcasts available on the internet, and many websites available for distribution at little or no cost to the producer or listener.

Podcasting is a method of enhancing several English language skills such as listening, speaking and extending vocabulary. With the use of podcast, anyone can create audio files of grammar or vocabulary exercise and post them on the internet for others to download.

There are various types of podcasts that learners or Teachers can use:

a. Authentic podcasts

Podcasts that are not designed for ELT students can often be a valuable source of listening. Most of these podcasts are only appropriate for the use of higher level students, but others, such as Sushi Radio are recorded by non-native speakers of English and their length (5-10 minutes) make them ideal for use with classes.

b. Teacher podcasts

These podcasts are produced by teachers and they often use them for their own classes. These podcasts are usually intended for helping students to learn by producing listening materials that are not available elsewhere, or that suits the local flavor. Madrid Young Learner and The Daily Idiom podcasts are two very different varieties of the teacher-produced podcast.

c. Student podcasts

These kinds of podcasts are created by students, but often with the help of a teacher. The students can listen to these podcasts and get information about other cultures and hear about the lives and interests of other students from other parts of the world. An interesting example is a podcast created by the Fudan university high school students in China. (Podcasting for ELT, 2015)

I. Multimedia Language Lab

The main purpose of language lab is to focus on sound, text images, videos, animation and interesting context that is accessed from electronic devices such as computers, mp3players, cell phones, and iPods. These tools can develop all the four skills of language as well as grammar skills. Thus Language laboratory has the following facilities to enhance learners' interest in grammar like online tutorials, teaching materials, audio recording, video recording, LCD, teaching software, games, functional grammar, and group discussion.

Electronic media has become an integral part of our survival and this is one thing that is universal and accepted by everyone. Learning through these methods has become a new age phenomenon and in the coming years, it will form a major part of a learning curve of a person. Thus the recent trend in teaching English is the use of modern technological tools as English language teaching has been affected a lot by the availability of these tools.

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Certificate

This is to certify that Mr/Ms/Dr. Khaled Kordi Tamandani

participated in a two day International Conference on Applied Linguistics (Language Teaching) organized by Masud Husain Khan Linguistic Society, Department of Linguistics, AMU. She/He has presented a paper entitled Using Praat Software for Non-Native Speakers' Intelligibility Assessment in Word Stress and Sentence Intonation

Prof. Shaik Mastan
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Chairman
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